The Information Resource for LightWave, Video Toaster, Flyer, Inspire, and Aura Users

NewTekNIQUES

October/November 1999
www.newtekniques.com

ROUGHNECKS: STARSHIP TROOPERS CHRONICLES

IS IT REAL OR IS IT LIGHTWAVE?

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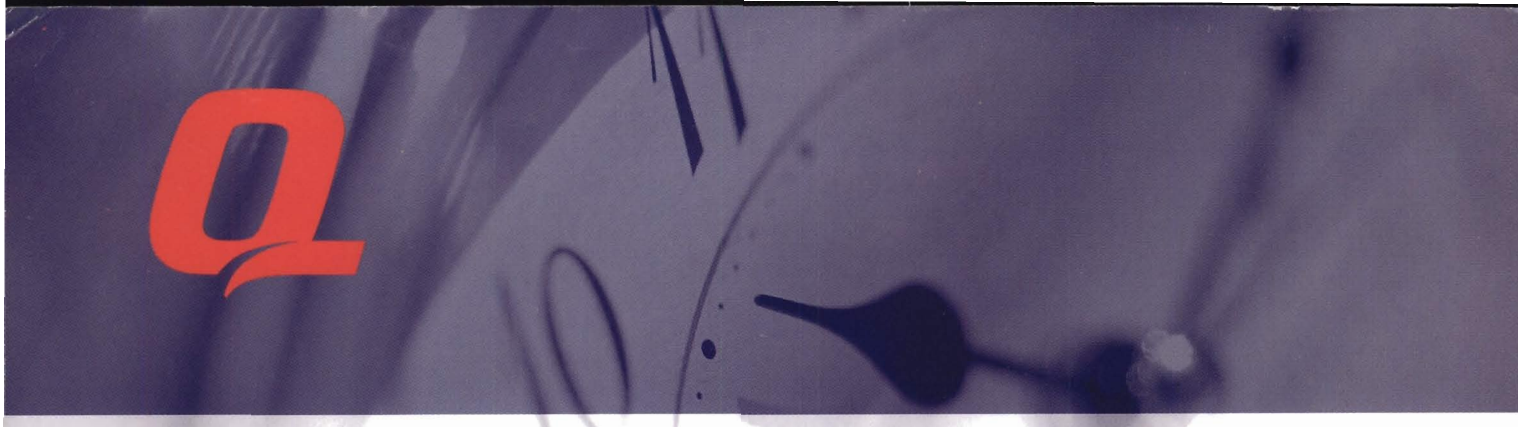

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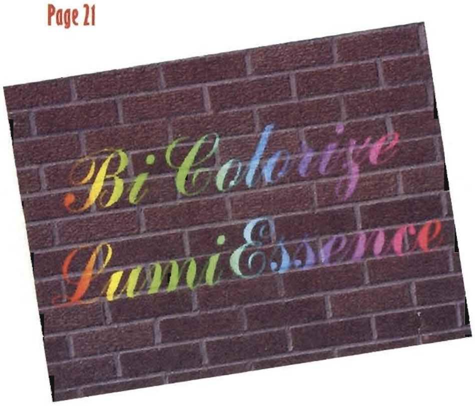

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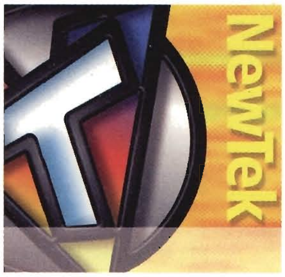

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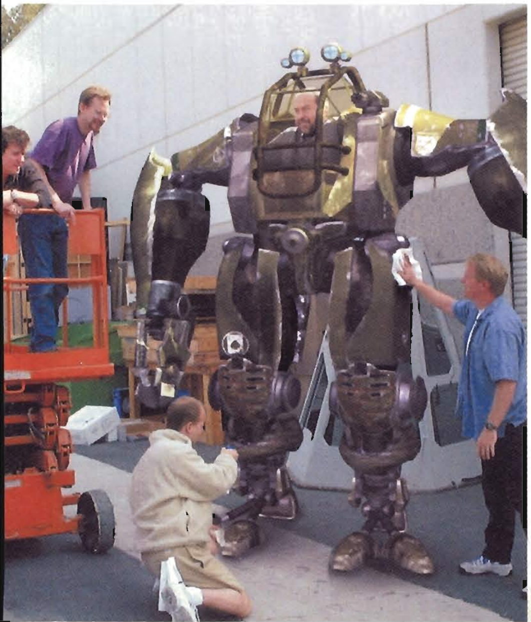

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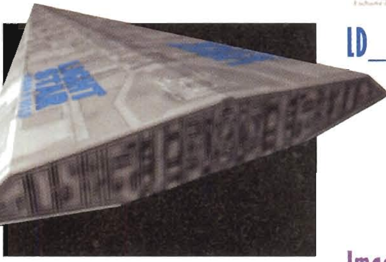

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Silicon Alchemy: Multimedia System Design 101 - Dave Haynie explains the various crucial elements that differentiate a multimedia computer from other computer designs. Multimedia is not just about the hardware - it's as much a software issue, as it is about the machine that powers it.

The Idea Factory: Making Music Promotion Videos - Two things that Bob Ketchum knows a lot about are the music business, which he's been in for a long time, and how to make money. Now put the two together, and maybe shake it all about, and you've got yourself another of Bob's fabulous money making ideas.

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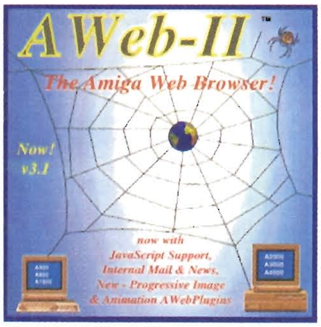
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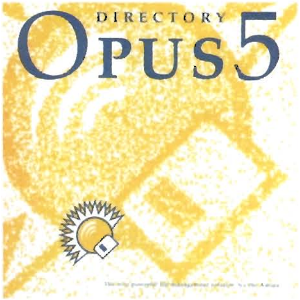
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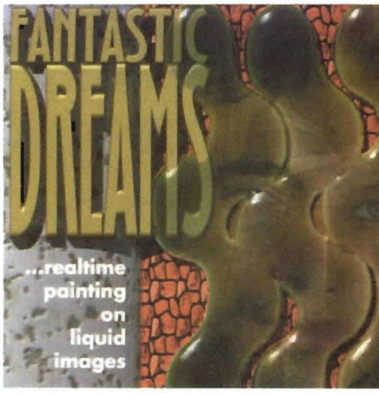
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NewTekniques

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First Words

A FEW WORDS FROM OUR EDITOR IN-CHIEF

ALL THINGS NEW

by
dhomas trenn

I can't begin to tell you how excited I am about all the things that have been happening here at NewTekniques. This job is like nothing I've ever experienced in my life. I am truly honoured to be among such an amazingly talented community of people.

Welcome, Mr. NewTek

I met with Tim Jenison, for the first time, on August 11th at Siggraph 99. It was nothing more than a brief introduction, with a handshake; but I admit, it was a bit daunting. If it weren't for this man, I wouldn't be here right now - there would be no NewTekniques magazine.

Tim was a bit preoccupied at the time, but it was clear that a handshake wasn't going to be enough. I was anxious to get to know more about what inspires him to his great vision of the future. So, the next day, Tim and I talked over a very long lunch.

I discovered long ago, that people who are sometimes looked upon as idols, are often not much different than ourselves. I learned that Tim and I grew up similarly, with common interests - particularly in the area of music and experimental projects. At some point though, we wandered on to different paths. While I focused more on the artistic side of things, Tim concentrated on electronics and technology development. But, we are both still tied to the other's path - it's unavoidable. People like Tim create the tools that people like me use to explore our artistic needs - it's a bond for life.

As we talked, two things became very obvious to me about Tim: he has a very clear vision of the future, and he is very much a technological wizard - complete with sketches drawn on napkins, and occasional interaction with his palmtop computer. I also found myself wondering, whether it was a coincidence that he reminded me a little of George Lucas.

I was intrigued and inspired by the many directions that our conversation travelled; and it seemed to me that a great idea that having Tim regularly share his thoughts and vision would be very helpful to us all. So with that in mind, I'm very pleased to welcome Tim Jenison into NewTekniques.

Other Things New

An artist can never have enough tools, so we've got FREE plug-ins for ImageFX and Photoshop users - a NewTekniques exclusive!

The Video Toaster is now shipping, so we're beginning regular coverage of it. This issue, we give you the details on what it can do.

No matter how good you are at what you do, there's always something you can learn from others in your field. So, we're introducing The Masters Series in Wave F/X, where you can learn from some of the best LightWave artists in the world.

Getting to Know You

Be sure to fill out our reader survey (p.31). In addition to helping improve our magazine, your survey submission also gives you a chance to win one of several fabulous prizes.

Last Words...

Hold on to your hats, the fun is just beginning!

Dhomas Trenn

dhomas trenn, practical visionary

ONLINE CONTENT

This article has additional
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When you see this symbol, it means that additional content related to that article is available in the NewTekniques Online bonus area. You'll most often see this with tutorials, when it means that support files are available for download, or that a variation of the technique is discussed in an online tutorial. For other articles, it might mean that demos, programs, or other related files are available online.

TUTORIALS

General

Keyboard shortcuts, and the keystrokes required to complete them, are enclosed in square brackets. [b] or [B], for example, refers to the lowercase letter, while the uppercase alternative would appear as [shift-b].

Gadgets are referenced similarly, either bracketing the gadget itself or indicating the value the gadget should be set to.

LightWave 3D

Generally, LightWave 3D tutorial functions are referred to as seen in v5.6. Here are some tips, for using earlier versions:

- Some functions have moved, for example, Render panel options may be in the Record panel, Camera panel functions in the Render panel.

- If measurements are not accepted as described, try converting values to meters. For example 1 cm = .01 m.

- Before v5.0, texture layering was not possible. Try using just the first texture described.

- If you still can not produce an expected result, consult your manual for more details on a function, or email the authors, they can help you get through with the version you are using.

Visions

FROM THE PAST, FOR THE PRESENT, AND INTO THE FUTURE

A Dirty Little Thing Called...

by
Tim Jenison

This is a Fisher-Price Pixelvision PXL2000 camcorder. That's right, a real camcorder, made by a toy company for kids. I bought mine brand new for $99, in 1989 - which was pretty cool. Even more remarkable was that it compressed audio and video onto a standard audio cassette tape.

The goal of compression is to cram a lot of information through a narrow channel. This can be a very good thing - certainly the Pixelvision wouldn't work without it; neither would DSS satellite TV or DVD video disks. But it can also be very bad, as is the case with the Pixelvision's video quality.

Home VCRs were made possible by a dirty little compression trick called *color under recording*. In this scheme, chroma is separated from luminance. The luminance signal is frequency-modulated onto tape like the big *uncompressed* reel-to-reel machines, but at a lower frequency.

Chroma, however, is heavily filtered and then recorded on tape as an AM signal, with horrible frequency response and noise levels. This trick works because our eyes have more sensors for brightness detail than for color detail.

But, guess what? It looks good enough to keep millions of Blockbuster Video customers coming back for more.

Make a VHS copy of a VHS tape, though, and the quality falls to pieces. Which is why it's a bad idea to do video production with VHS.

How about digital compression? Well, for the same reason, it's a bad idea to use compression in video production. Just like *color under* video, most compression schemes, such as M-JPEG, drastically reduce color resolution as a first *easy* step to reduce the amount of data. This gives the video a characteristic softness or *JPEG look*.

Another insidious problem with digital compression is *concatenation* - where something that has been digitally compressed is compressed again, possibly by a different method. The result can be much worse than the old analog *generation* loss. *Artifact* becomes *hallucination*.

Video must be kept as pristine as possible, through every step of the production process. Fortunately, the plummeting cost of computer hard disks is beginning to make uncompressed editing affordable. (Hint: That, and our new Video Toaster!) With uncompressed video, the millionth copy is as good as the first.

My $99 Pixelvision camcorder has a look to it that some people find charming. Today, these cameras are valuable collectors' items. Several avant-garde filmmakers have made Pixelvision movies. I guess it proves that you can make a movie with a $99 equipment budget. But, would you pay six bucks to see it?

Tim Jenison, NewTek Chairman & Founder

WAVE F/X

LIGHTWAVE SUCCESS IN THE COMPETITIVE TV & FILM F/X MARKET

> "I have a lot of people ask me how many polygons I use. I use as many polygons as necessary to make it look right."

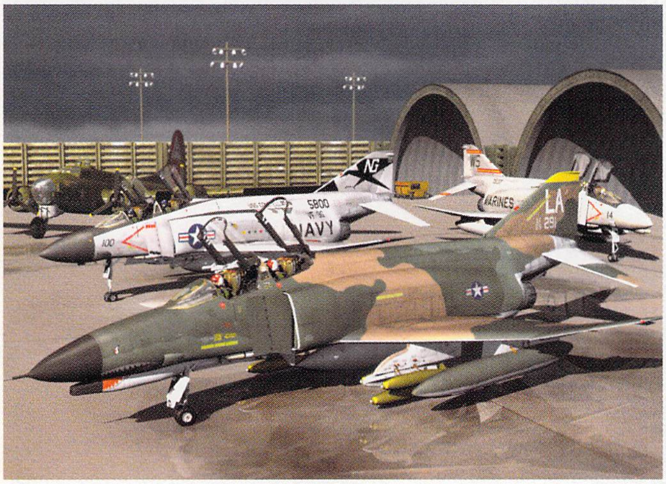
by
Greg Nelson

THE MASTERS SERIES

LightWave Master: Bill Arance

In my time in this industry, I've been privileged to meet and work with some of the best and most successful animators, modelers, visual effects supervisors, and artists in the business.

In an effort to help anyone who wants to become a better LightWave artist, and get a chance to learn from those who have defined their craft, Wave F/X is beginning The Masters Series. We'll get inside the minds of the brightest and most creative people in the industry - giving you the opportunity to hear their philosophies, their stories, and learn how they got it done with no time, no sleep, and no money.



Attention To Detail

By his own admission, he's a little crazy. You have to be when your philosophy on detail goes something like this... "How do you want the threads on that bolt, metric or standard?"

Bill Arance is one the best and most detail oriented modelers/ artists in the business.

He began his film career working as a storyboard animator on the now classic film *The Deerhunter*. From there, he moved on to one of my favorite films as a kid, *Tron*. He also has screen credits in *Ghost*, *Who Framed Roger Rabbit*, *My Favorite Martian*, and most recently the animated television version of *Starship Troopers*.

I first had the opportunity to work with Bill on a ride film called *Top Secret*, a couple of years ago. After that project ended, Bill showed me some of the work he was doing with modeling LightWave airplanes.

He was in the process of working on a new model at the time, "I wanted to build and texture a plane that looks real from any direction, three feet from the camera."

I didn't get to see the plane until he was 200 hours into it, and that was just building the model. My immediate reaction was, "Two-hundred hours! You're crazy!" Another 200 hours after that, I got to see it again – this time with paint. I don't think I need to tell you that his effort paid off.

Work From Real Life

Bill says, when you're going to try and mimic something in reality, it's really important to get as much reference material as you can.

"I have a real advantage," he said, "in that when I'm building a plane, I'm building something that actually exists. So, I can actually compare my model to reality."

One place where a lot of animators fail is in not actually going out into the world and studying. "We all remember the pictures of Walt Disney bringing deer into the studio, while they were making

Bambi, and letting the animators sit around the poor thing as they watched it move," he said.

Even if you don't remember the pictures of Walt and the deer, it doesn't matter, because the same principle applies in the LightWave world as it does in the cel animation world.

"Let's say you're going to build a garbage truck. The first thing you need to do is go find a garbage truck, then stand there and look at it for awhile. As you're standing there, you're going to be able to see that it's dirty. But, it's not just an overall layer of grime, it's dirt, upon dirt, upon dirt."

He went on to say that this is one of the areas where LightWave really excels, because it's surface panels support multiple channels and allow you to layer that kind of dirt onto your model.

"If you really study the truck, you begin to realize the black smudges on the side are where the diesel exhaust hits the truck. A lot of the greasy smudges are from hydraulic fluid leaks, and the smooth shiny areas on the handle at the back are where the man's gloved hand touches it repeatedly every day."

Knowing this kind of detail is extremely important, especially when you begin surfacing.

The Personal Touch

"When it comes to surfacing," he said, "You can never make your image maps too big. I began building and painting these models a couple years ago when my computer could barely handle it. Now, today's computers have no problem with it at all."

Bill likes to paint color, specularity, diffusion and bump maps by hand. Primarily because it gives him significantly more control over the look, and because it is part of the art of the craft.

"A lot of people ask me why I don't just take a picture and paint it on?" he said, "I don't know. I guess since I'm doing it for myself, I feel like using a photograph is cheating."

He does admit that that's not always a practical view, "If you are working for a client, and mapping a retouched photo helps you make the deadline, then absolutely, do it."

Tips For Team Success

One of the things you need to realize in this

NewTek Day in L.A.
Friday, December 10th
Raleigh Studios
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Video Toaster NT
Music
Tips and Tricks of LightWave [6]
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industry, is that you always have something to learn or teach. "It's really important," he said, "to develop an understanding with the people you work with."

Everyone models differently and if, for example, you are called upon to paint and surface another person's models, its important to understand why they model the way they do. "I could spend a full day disassembling someone's model and putting it back together the way I want it to be, but that's a day wasted," he said. Instead, take a little time to talk it over with the modeler and get an idea for why they took a particular approach. A few minutes of conversation will save much weeping and gnashing of teeth in the end. To save a lot of trouble for someone else later on, you should ask yourself the question, "If I walked out the door today and got hit by a bus, would anyone know how to finish my shots?"

One of the most important things Bill does, is leave a paper trail. The sign of a true professional in this industry, is someone who can make it very easy for someone else to pick up where they left off.

It's Only A Tool

Bill suggests that you not become so heavily reliant on a computer, that you're completely useless without it. What happens if the power goes off? Can you still be productive? Bill believes if you're going to be an animator, you should know how to draw. That way, you at least have some means of expressing the look or style you're going for, without having to shovel the mouse around.

Also, "If you're always using plug-ins, your work will always have that plug-in feel." Bill advises animators to really take the time to get into their scenes and do the work of animating. It may be harder, but that extra effort really stands out.

Love What You Do

"My parents told me a long time ago to love what you do, because you'll be doing it a lot."

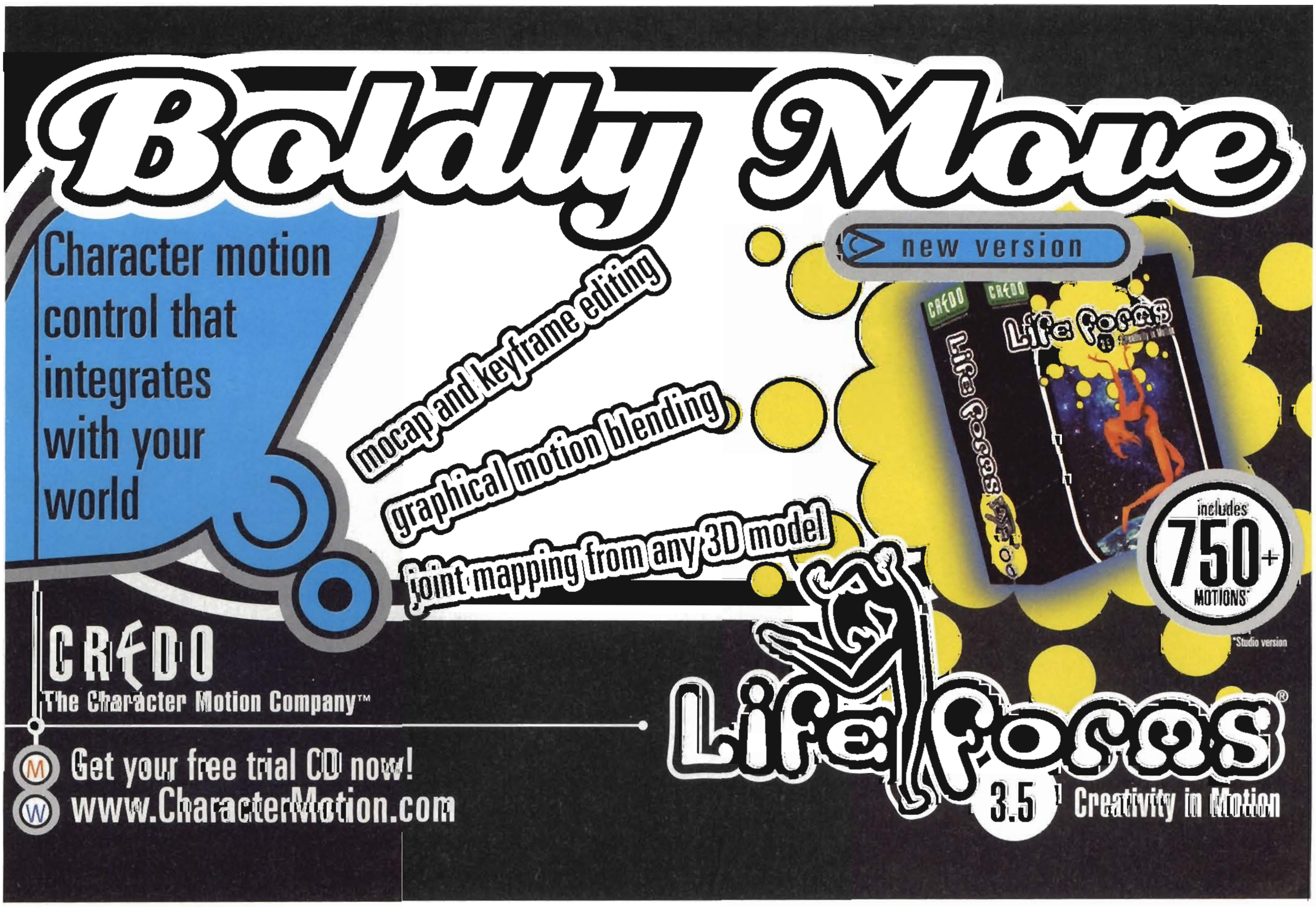
That is a really important factor when considering a career in the effects industry. As much as software manufacturers want to tell you how easy their product will make your life, it won't. Doing effects well, is a difficult task - it always has been and always will be. If you don't love it, you might want to consider another career.

847
POLAR
847

Bill Arance is one on a long list of people I've come to respect in this industry. He is a passionate artist and a pure technician, a combination rarely found in any industry. If you ever get the privilege of working with him, be prepared to learn.

You can find out more about Bill and his work on his website at www.arance.net. NT

Greg Nelson is a Senior Animator at Threshold Digital Research Labs.
You can email him at kidneyboy@msn.com


Boldly Move
Character motion control that integrates with your world
mocap and keyframe editing
graphical motion blending
joint mapping from any 3D model
new version
CREDO
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Creativity in Motion

Web # 200

In Roughnecks: *Starship Troopers Chronicles*, grizzled veterans lead a brave company of raw recruits into battle against alien insect hordes. — War is hell. In a case of life imitating art, veteran LightWave animators are leading a sleep deprived company of talented recruits into battle against vicious virtual bugs and blood thirsty deadlines. — CG war is hell.

"It's intense. I've never been involved with a project like this," admitted Everett Burrell, the *Roughnecks* Project Leader for Flat Earth Productions. "It's incredible the amount of detail that went into this. We had animators dropping like flies, because they couldn't take the pressure."

This killer project masquerades as a children's cartoon show. But, *Roughnecks* is also one of the most ambitious 3D animated television series and audacious LightWave assignments ever attempted. "We are really kicking up the look and level of excitement," described Jeff Scheetz, Foundation Imaging's Animation Producer on *Roughnecks*.

"I came from Netter Digital where I worked on *Voltron*," said Chris Zapora, a *Roughnecks* CGI Director at Flat Earth. "This show is orders of magnitude more complex. The quality of the models and the art direction are approaching a movie quality look. It has a much more cinematic feel to it - especially in the texture and the lighting."

In fact, *Roughnecks* is a spinoff of the 1997 Paul Verhoeven live action movie, *Starship Troopers*, which was based on Robert A. Heinlein's novel of the same name. *Roughnecks* is developed by Sony Pictures Entertainment and is headed by Richard Raynis, the Executive Producer and creative visionary.

RAZAK
MOBILE
1

Sargent Brutto and Lieutenant Razak of Razak's Roughnecks.

WRITTEN BY: DICK DE JONG AND MOLLY DINKINS
IMAGES BY: FOUNDATION IMAGING, FLAT EARTH PRODUCTIONS

ROUGHNECKS: STARSHIP TROOPERS CHRONICLES

IS IT REAL, OR IS IT LIGHTWAVE?

Join the Mobile Infantry

Originally, Sony envisioned producing *Roughnecks* as a traditional 2D cel animation, but John Skeel, *Roughnecks*' Technical Supervisor for Sony, was familiar with Ron Thornton and Foundation Imaging's LightWave work (In the mid-80's, Skeel co-founded Aegis Development, the publisher of VideoScape 3D, Allen Hasting's precursor to LightWave). Skeel brought Raynis out to Foundation's studio to meet Thornton and to view *Vortex*, an all CG in-house project about Earthlings battling an alien force. Raynis was impressed and *Roughnecks* became a 3D production.

The first season called for 40 half-hour shows. The problem was that the programs were slated to debut in early September. To meet the daunting deadline, Thornton suggested that Sony enlist his old friend, Kevin Kutchaver and Flat Earth Productions to share the burden. The initial agreement was for Foundation to produce twenty-five episodes and for Flat Earth to create the other fifteen.

To meet the challenge, Foundation recruited almost 100 LightWave animators and Flat Earth added 45. But, by the time the new teams had finished modeling all the characters and bugs and started animating the first few shows, it became painfully apparent that the original deadlines would be impossible to reach.

"The show, because they wanted it photoreal, was a huge undertaking," Burrell explained. "I'm amazed - it looks great - but that's a lot of shots - 450 to 500 shots a show. It's just a giant beast. It's a massive undertaking. We're talking hundreds of gigabytes of data - thousands of gigabytes - it's just intense."

"Richard Raynis has certainly pushed the show into being the most amazing thing that anyone has ever seen," Kutchaver added. "On the other hand, the price you pay is that you can't work on everything forever. At a certain point you say, 'Isn't that rock texture good enough?'"

"The computer is the spoiler - a blessing and a curse," Kutchaver continued. "Because the computer is doing it, it seems like, 'can't you just tweedle a dial?' Yeah, but it still takes time. The next thing

Animator Joe Lawson sets up the climactic finale of episode 102, under the direction of PJ Foley.

you know, you've spent a week trying to fix things and you haven't done the next show. It's a balancing act - it gives you the capability of doing a lot of great things, but you can only do that if you are very smart with your time."

After completing two episodes, Flat Earth stepped out of the project. "We couldn't come to an agreement in terms of how to proceed to do the future episodes," Kutchaver commented. "There didn't seem to be an answer to satisfy all the parties." Perhaps, as some sardonic omen, the Flat Earth episodes took place on a planet called Tophet. Tophet in Judaism, is the word for the underworld where souls suffer torment.

[As the magazine goes to press, Sony has enlisted two other facilities to take up some of the slack, Rainbow Studios in Phoenix, and Hyper Image in Los Angeles.]

Preparing for the Battle

Even though *Starship Troopers* had been a full length movie, Raynis wanted the television show to have its own look. Nothing was used from the movie. Every bug, every soldier, every spaceship, and every planet had to be modeled and textured from scratch.

"At the very start, Foundation and Flat Earth built a model pack," said Ron Herbst, a CGI Director at Flat Earth. "Our original contractual obligation to Sony was to put together a bunch of working parts for the entire series. It had every single character in their fatigue costume and in their power suit. The pack also contained the Valley Forge spaceship, the one man fighters, and all of the bugs that are the standard issue bugs - the warrior bug, the tanker bug, the plasma bug, the blister bug."

"We met up with Foundation and basically divided up the model pack," added Bryan J. Blevins, Flat Earth's 3D Modeling Supervisor. "We took various spaceships and robot creatures, and battle mechs. Foundation was going to build all the troopers, the human characters, and we took all the bugs. It kind of worked that way, because we have a lot of experience building the creatures for Herc and Xena [*Hercules: The Legendary Journeys* and *Xena: The Warrior Princess*]. To make something really organic, is harder than it looks. We've got tons of experience doing it."

Roughnecks

"We were the first department to get rolling on this," said Foundation's 3D Modeling Supervisor, Dave Adams. "At the peak of the first month, I had 25 people modeling. We did a lot of overbuilding initially."

"Fil Barlow, he's an Aussie, [Sony's Creature and Character Designer] did all the initial designs for the first set of characters for the first five episodes. After that, we started to contribute - designing extra, incidental characters from the ground up."

Barlow's initial designs reflected that *Roughnecks* originally was planned to be cel animated. "They were very cartoony, 2D designs," Adams continued. "In some ways, they were not unlike characters from *Dick Tracy*, where you had guys with very wide flat heads and wide spaced eyes. Sony did not want photorealistic human faces."

"Fil came from a really stylized approach and we all gravitated to the middle. We built the closest 3D equivalent to the 2D designs as we could, and he tried to accommodate us by adding profiles and 3/4 drawings. In some cases, Fil came in and we made tweaks onsite."

"The first series of models that we did, we started from scratch. In the beginning, we loaded up the sketch in Modeler and modeled from the sketch by hand with splines and patches," Adams explained. "We kept it stylized by keeping the level of detail low. For example, the ears are anatomically correct but they're not sharply defined - a little gummy."

"We also kept the surfacing slightly stylized, where no one really has age wrinkles or liver spots. We made the hair out of geometry in most cases and we would add a clip map."

To handle the demands of dialogue, a series of morph targets was created for each head. Using Morph Gizmo to control the targets, the animators were able to lip sync to the script. This is also the method used to control features of the face that indicate mood.

Perhaps the biggest challenge in modeling the troopers was keeping all the pads and flaps on the troopers' uniforms moving in sync with their bodies, without cutting into each other and causing rendering errors. Foundation employed a method of *exploding* the model.

"All the characters have heads separate from their bodies," Adams explained. "Aside from the base body, all the armor they're wearing is pulled way out, so their bones and the area of influence couldn't possibly affect anything else. Then all the geometry for all the various flaps and parts of the armor were pulled back in Layout and repositioned. We used Relativity [Prem Subrahmanyam's LightWave plug-in] to let flaps get out of the way of legs, and shoulder pads get out of the way of arms."

Even though they were deep into the production schedule, Adams said, "We're still getting new designs daily. We've done over twenty characters. Generally, it takes two to three days to get the character built, textured and approved." A new character really means a new head. Foundation has developed three sizes of female bodies and four sizes of males. "The heads pop onto the bodies like Pez dispensers," described Adams. "Fil has taken to sending us photos of his fellow employees as designs. We have drifted away from the whole stylized look to make everybody anatomically believable."

Bugs

While Foundation was creating the troopers, Flat Earth was assembling the opposing forces. Again, Barlow supplied the 2D designs and the Blevins led team at Flat Earth, translated them into 3D hordes.

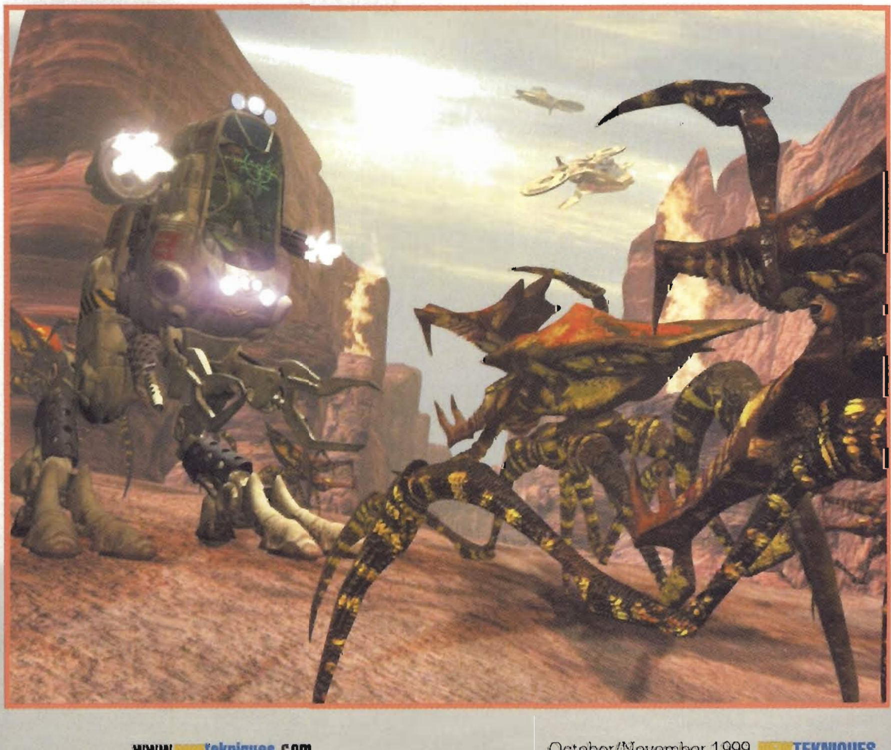
"Fil would come over and look at the models," Blevins explained. "There were certain contours, certain jaw lines, that he really liked; and we would try to keep those in 3D. It's a challenge, because artists can draw something in 2D that cannot be built in three dimensions. So it was pretty cool to have Fil over so that we could show him certain little problems that we were having. We would sit down at the computer and, almost like modeling on the fly, we could make little tweaks."

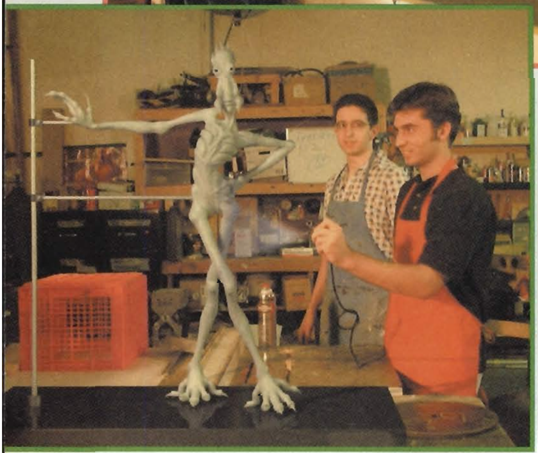
"After we got everything modeled, we would make a scene hierarchy out of them," Blevins added. "We had a number of hierarchies. We built a straight inverse kinematic (IK) hierarchy, that could be completely animated by our character animators. I would send some of my preliminary setups over to our lead animator, Spencer Cook, and he would do a quick animation and see how things were working. We would fine tune the IK limits and then spend three days to a week experimenting with different bug setups that would render right, but would also update quickly in the computer."

"We rented a lot of documentaries about insects and studied how they move," added Chris Zapora, Flat Earth's CGI Director. "A bug can be a beetle but when it's 40 feet high, it's more like a rhino or an elephant. We would think about those creatures, and put that into our animations. Then we would do a test, and wonder if he needs to drag his rear end more because his legs wouldn't support his weight. Or, maybe his legs need to be back more to give him a better center of gravity. Or, he needs to sway more because he's top heavy. We would take all those things into consideration and put them into our control setups."

"We have basic behaviors baked into the assembly of the model and then we control those through Relativity and nulls," Zapora described. "For example, the tanker bug, which is the big flame thrower bug, you can just move a null from left to right and the bug will actually walk from left to right, drag its feet, and lumber around. If you rear him up, all

Publicity poster featuring many of Flat Earth's contributions to the Roughnecks' universe: duck marauder, warrior bugs and skimmers on the planet Tophet.





TOP IMAGE: Brian Chambers prepares Stuntman Derek Morton for THE TANKER BUG RIDE in episode 101, under the direction of Stunt Coordinator Dave West.
ABOVE: Character modelers Steve Toccaceli and Tom MacDougall apply a coat ofprimer to T'phai, a Skinny from the planet Tophet, in preparation for his debut in episode 114.

the plates will move kind of like an armadillo or potato bug."

"In the very beginning, they wanted to see - I think the number was - 'billions' of bugs. In our case, billions might mean hundreds. Though there were a couple of scenes where we had thousands," Zapora explained.

"We had our animators hand animate some nice walk cycles and then add some variations on those," continued Zapora. "We built up a library of bug behaviors. We could do 15 or 20 moves and reuse them. We would have someone write a script that would allow us to duplicate them out and have different controls for different actions. So we can have ten bugs - they can all be walking - though they all look like they're moving differently. By moving nulls around we can have them screech or rear up at different times. So it looks like we hand-did all this, though really we only hand-did one instance of each of them. For the larger groups, we would have lower polygons or even non-polygons on these bugs and use Particle Storm to pull them around. For the extreme close-ups, we would often do those by hand."

Blevins added, "We even have setups where one bug is an object, and his walk is two or three morph targets. We used those for the distant warrior bugs. It's much less overhead as far as LightWave is concerned; and it doesn't bog down the system; so, we can get the shot out a little faster."

Planet of the Week

"We go to a different planet every five episodes and we design extensive, intensive set pieces for each planet," Adams said. "We've gone from Pluto to a totally water planet. Next up is the jungle planet - and we'll have an ice asteroid."

The Sony designers "draw up the terrain in B&W and they give us a lot of color and sky references that they've culled from various sources," Adams continued. "We start with a very high resolution subdivided terrain and then use polygon reduction programs to bring it back into line. One of the hardest things was building photoreal vehicles and terrains as low poly as possible, while keeping it from looking low poly. The scenes have to be as efficient as possible, because we set an in-house render limit of about ten minutes per frame."

"The water planet was particularly tough because they wanted a constant overcast, threatening sky look. We created 'enviroballs'. They're huge high res images mapped on the inside of a sphere that create a kind of virtual set in the background that's used for sky and water."

Mobilizing the Troopers

"The key to this show absolutely was motion capture, and I didn't realize that until about half way through," admitted Burrell. "Richard Raynis, the producer, would turn stuff away if it was keyframed. The motion capture stuff was the most complicated stuff that I've ever seen in my life. The power suits are just incredibly complicated. I'm amazed it all worked. Sometimes it didn't, most of the time it did."

"All the models were built in such a way that they matched bone for bone our mocap [motion capture] data," Adams said. "Initially, we built a set of IK characters, until we had our mocap fully up and running. As soon as we were getting mocap data, we started abandoning those. They get used for inside of vehicles when they are driving things or waist up shots - things that are too subtle to mocap." Indeed, motion capture is used for 90 to 95% of all the trooper's movements. For more than a year, Foundation has been using motion capture equipment in their projects. Until recently, they were employing an Ascension magnetic system. Last summer they added a fourteen camera Vicon 8 optical system.

"Doing stunt work in the magnetic is hard because in our system, the actors are tethered with a wire," explained Dave West, Foundation's Motion Capture Supervisor. "In the optical, there is no tether so you are free to do stunt work. Also, with the fourteen camera system, we have a much larger active area - about four times the size."

West uses three motion capture performers [Derek Morton, Robin Huber, and Scott Altizer] who play all the characters. "The animators decide, by way of the storyboards, the actors' blocking," West described. "They know basically how big the stage is and if we have to do a movement that's bigger than the stage, we'll do motion blending. We break it up into scenes and blend them together with the Kaydara FiLMBOX system. We export a LightWave scene file out of FiLMBOX. As far as cleaning up any jittery data, we do that in FiLMBOX, too."

If the animators need to make any adjustments, "we have built our skeletons and bone structure in LightWave so that each joint, for example, the shoulder or wrist, has another bone in the hierarchy that allows the animators to offset the rotation," West said.

"A lot of people who have seen the footage can't believe it's motion capture or that it's LightWave," West said. Expect to see even more amazing motion capture in the future. "We're looking at buying crash mats, wrestling mats and flying harnesses for zero-G stuff," West revealed.

The Spoils of War

"Our teams now have 10 animators and 4 technical directors," explained Dave Morton, one of Foundation's Directors of CGI. "Each team is responsible for an episode. The animators handle the character animation and setting up the initial scene. Then the technical directors will go in and do a 'sweetening' and add the lighting, the atmospherics and some of the additional surfacing."

"We treat this more like a film or an actual television show, rather than a cartoon," Morton continued. "We do specific lighting setups for a character where you have a back light, key light, and fill light rather than a cartoon where you just drop a light in and that's your only light source in the scene. It's something that we've had to teach our animators."

"We use three image filter plug-ins that we render on every one of our scenes to get a more film-look quality," Blevins described Flat Earth's method of image processing. "One of those is LightWave's built-in blur, just to soften the image slightly and to take the hard, CG edge off everything. Blevin's Light Diffusion mimics the slight diffused bloom effect that you get when you expose something to film. The third plug-in that we put on top of that is Worley's Film Grain, to just add a little bit of noise."

"Once we saw the first episode actually put together with the sound, sound effects, and music - it is a much more sophisticated show - not only visually," Kutchaver concluded. "It is being handled like a live action film. How often do you actually see early morning kid shows introduce any kind of film language? A lot more sophisticated camera work is going on as well. I think kids are capable of grasping more than 'Here is the monster, we'll be back.'"

"In terms of the quality of animation - the look and feel - it's the best CG show on the market," Skeel added. "I think we surprised him [Raynis] because we have surpassed his original vision."

"I'm convinced that this is the way that kid's action oriented programs will be done from now on," Scheetz predicted. "In terms of the LightWave community, this trend will provide thousands of jobs in the years to come. There will be huge needs for artists with facial and character animation skills, and with lighting and effects backgrounds."

But Scheetz added, "The process has so much more to do with virtual movie making - not just animation."

BELOW: "Doc" - designed by Sony Character Supervisor Fil Barlow, and modeled by Jake Bergman.

BOTTOM: Pictured (from left to right): Private Albert of Morton's Maulers; Private Kimmel of Vector Squad (Mike Kimmel); Lieutenant Timmy of Morton's Maulers (Tim Pyle); and Major Karner of the Valley Forge fleet (John Karner).

Albert was originally an extra from episode 103. In episode 107, he was one of two injured troopers who took Carmen's seat on the retrieval ship, leaving her behind to battle bugs with the ground troops. In both episodes, Sony either cut the scenes or requested to have them redone without Albert present. As one Sony producer put it, he liked the Albert character. Unfortunately, whenever he was on-screen, the viewer's attention went directly to him - and it became "The Albert Show". A memo from Sony asked rather politely for Foundation to "please remove Albert from the list of available extras". So, officially he's out; but, unofficially...

Director Dave Morton supervises repairs to Dizzy's head. This state-of-the-art animatronic head is the brainchild of robotics genius Tareq Mirza.

"I've done film production and I know how many people are on the set. We had to be all of them." Herbst confirmed.

No Guts, No Gory

"My kids loved it," commented Kutchaver about his two young daughters' reaction to *Roughnecks*. But critics of the show, question targeting youngsters [the program is being scheduled in the before and after school time slots]. One of the concerns with *Roughnecks*, is the level of violence infused into the fabric of the show. Without a doubt, the bug body count in every episode is astronomical.

Animators at Flat Earth acknowledged that they were given some limits and guidelines. Even though our Roughneck heroes are constantly in Triple D [really deep doo-doo], we only hear about human casualties - no trooper ever dies on camera. Even though, in a flashback, Razak's hand is severed by a nasty bug bite, no blood is spilled. As a matter of conscience, the kiddies will never see human blood lost in battle. Of course, the green gut goo from the battered bugs, is exploded and splattered across the screen in almost every scene.

The *Roughnecks* also bear an assortment of armaments that would stir an NRA member to pistol envy. But the policy is that the weapons have to be futuristic, with no bullets and no shell casings. [Whew!]

Whatever the thinking by adult critics, Kutchaver trusts his children to know better. "When the marines were shooting the bugs, my seven year old turned to me and the only comment she said was, 'Those are the bad bugs, right?' She's already learned a valuable lesson - some bugs have to be eliminated. This is actually an educational show - we should get a grant. I would like to see the troopers attack the Teletubbies."

Check Your Local Listings

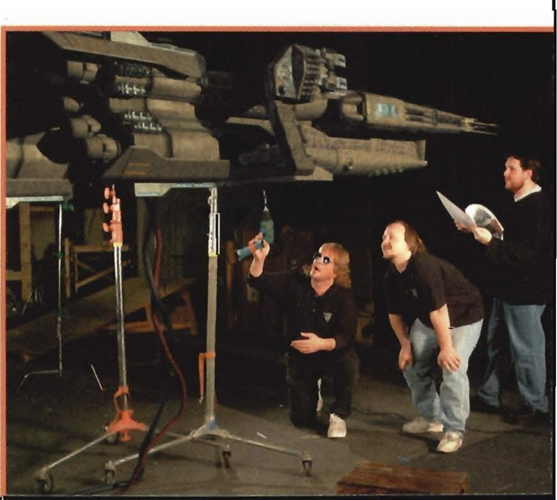
"We were hoping that Richard Raynis would actually be able to go and say 'look, this is such a unique special thing. Are you sure this is the way you want to have this out there?'" mused Kutchaver. "I was hoping for the HBO / *Spawn* slightly older audience approach."

But for now, it's still a kid's show with a kid's time slot. Since September, *Roughnecks* has been broadcast weekdays on UPN stations as part of the Bohbot Kids Network (BKN). Depending on your station, the show could be playing early in the morning or perhaps in the afternoon. The Sci-Fi Channel has also picked up *Roughnecks*. Ironically, the network also scheduled the program for the early morning.

"The show is more sophisticated than anything else in that time slot," so Kutchaver advises adults: "Watch the farm report, and then Troopers."

Dizzy was wearing this LightWave logo t-shirt in episode 105. Upon its discovery, and fearing a lawsuit from NewTek, Sony gave Foundation one hour to secure permission for using the LightWave logo. Donetta Colbosch, VP NewTek, saved the day (and thousands of dollars in digital correction) by giving the okay - just in the nick of time.

Model Supervisor Dave Adams, Director Mike Stetson and Director of Photography Robert Baldwin prepare to shoot exteriors of the Valley Forge. This model contains over 2000 lights, and took a team of 12 people six months to build.



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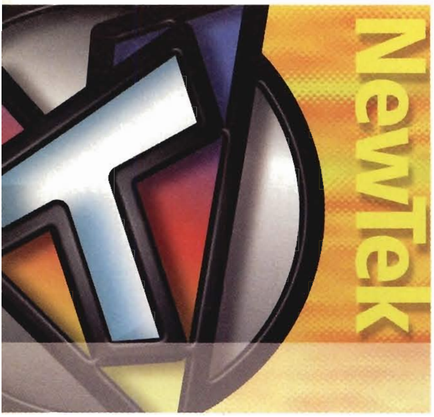


NEWTEK'S NEXT VIDEO REVOLUTION

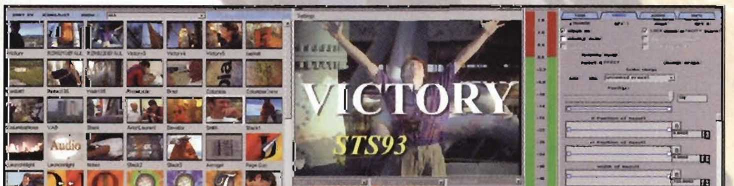
The NEW Video Toaster

by Ray Cronise
and dhomas trenn

"At $159,000, the uncompressed high end is getting closer to being called affordable, and that means lots more of us will be using it." — While the rest of the world is excited by recent quotes like that, there's a whole other world of videographers and filmmakers who have come to realize that less is more - and better.

The Next Revolution

Revolutionizing the video industry is surely no easy achievement; so for NewTek to try, and achieve it a second time, definitely suggests that these folks really have a vision of the future. Whatever the source of their futuristic insight, be it a crystal ball, a time travelling device or just creative ingenuity, their recent release of the new Video Toaster has created a lot of excitement in the community.



Speed Razor

Before we delve into the details of what the Video Toaster can do, it's important that you realize why this product is so revolutionary.

The problem with designing a product for today, is that technology changes so very quickly. The moment a product is released, it's already on its way to being obsolete. The Video Toaster is different. Much of the Video Toaster hardware was designed before the technology even existed to power it. It is very much a product of tomorrow, but available and affordable today.

Many people have heard the scientific idea that humans only use a very small percentage of their brain. That the brain is potentially much more capable than the limited tasks we ask it to do. This idea, is the very essence of the Video Toaster design. But, there is one important difference... NewTek is already very aware of how to tap into the extra capabilities of the Video Toaster brain.

Hardware With A Difference

One of the things that makes the Video Toaster so different from other competing systems, is that the hardware isn't responsible for the generation of effects, transitions, and other features that typically require the inclusion of various custom chips and specialty hardware architecture.

Instead, NewTek developed a much more powerful and expandable software based system, code-named the "LucasCode" effects engine. In doing so, NewTek is able to do things in software, that many might consider impossible. The major benefit of this technique, is that as computers continue to get faster, the Video Toaster becomes even more powerful.

Think of the hardware as a grand central station, where all of the video is collected. It has the proc amp, time base correctors, and audio components - everything necessary to take incoming video into the digital world. But, don't let the small size of the board fool you. Thanks to shrinking hardware technology, the

new Video Toaster has over 10 times the onboard logic as the original Amiga Video Toaster had.

Is it Dual Stream?

Perhaps we should first explain what dual stream means. The Amiga Flyer, for example, provides dedicated channels for video and audio. At any moment in time, the Flyer can read video data from any two video drives and pass those two streams through custom effects. That's dual stream.

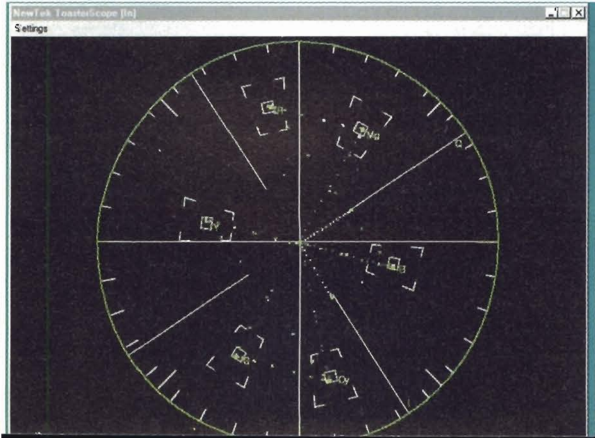
Many NLE cards offer similar technology, by including onboard drive controllers, and hardware based keying and effects. The problem with this hardware approach, is that the video card's capabilities are carved in stone. When hard drive technology or system performance improves, a hardware-based card can't take advantage of it.

The Video Toaster differs, in that it doesn't have dedicated channels per se. Instead, it lets the computer's drives do the work. The more powerful the disk array, the more capable the Video Toaster. Each stream of uncompressed D1 video requires a sustained data transfer of 21 MB/s. So, for dual stream you need 42 MB/s, and so on. The theoretical limit of 33 MHz/32 bit PCI is 132 MB/s; and with the new double wide, double speed PCI, the theoretical limit is 528 MB/s. As CPUs and drives get faster and faster, more of this bandwidth can be exploited for video streams. In addition, a fast drive array can be used by other applications as well, thereby allowing a performance boost to any application on your system. A video card no longer bottlenecks access to fast video drives. This is a clear advantage to the Video Toaster.

What About Real-time Transitions?

Everyone wants real-time effects. NewTek understands this more than anyone, as these were features on its Amiga Video Toaster card ten years ago. They also know that doing it in hardware is both expensive and limiting. The Video Toaster currently allows only one stream of video. So, all effects and transitions are rendered. Most Amiga Flyer users will notice no real difference when rendering transitions - already being used to the Flyer's "processing sequence" when preparing a project for play. But keep in mind, we're talking about uncompressed D1 video - rendered segments will be very high quality.

Vector Scope



But, don't think that NewTek is stopping at a single stream. In fact, the Video Toaster's real-time effects engine was demonstrated at NAB 99. Currently, this engine is being integrated into Speed Razor. In addition to real-time play-back of effects, this system will let you play custom transitions generated with LightWave 3D. This means you can have real-time transitions with objects, reflections, volumetrics, motion blur, depth of field, etc.

The Virtual Studio

The software based approach also offers some very exciting bonuses. Gone is the requirement for additional expensive hardware, such as time base correctors, waveform monitors, vectorscopes and display monitors. Instead, those functions can be added in software. Two of the best examples of this are the ToasterVision and ToasterScope applications that come with the Video Toaster.

ToasterVision gives you crystal clear, real-time, 60-field/second play-back of video on your VGA monitor. You really have to see it in action to fully appreciate this feature.

ToasterScope allows the user to do real-time video monitoring of input or output signals with a waveform monitor/vectorscope. When you adjust the input settings on the Video Toaster using ToasterScope, you are actually displaying the mathematical definitions of ITU-R BT.601 video (D1). This means you get very accurate readings, that guarantee you will be able to meet the most demanding broadcast specifications.

The Tools of Creativity

The Video Toaster also includes three other powerful software tools: Aura VT, LightWave VT and Speed Razor 4.5 SE. With these three packages, there is almost nothing a video editor can't do in terms of production. Each of the packages has been optimized to work with the Video Toaster's uncompressed D1 video format and allows stunning digital video effects, layering, compositing, and character generation. All of these programs are in the process of getting major upgrades, so the future looks bright for even more capability.

Speed Razor

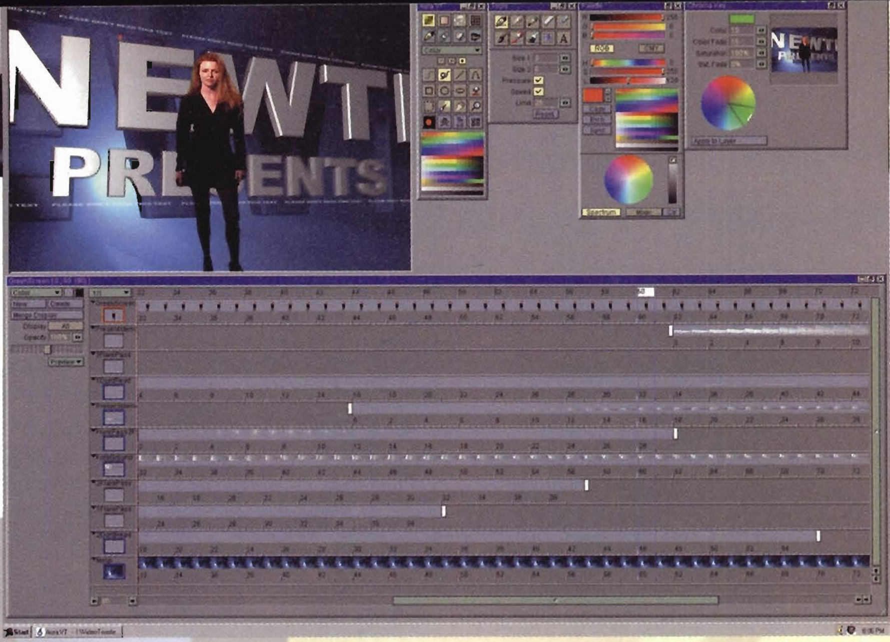
It is fair to say that when it comes to releasing a product designed for the future, in-sync has a lot in common with NewTek. So, it was a reasonable choice for NewTek to add Speed Razor to its set of creative tools.

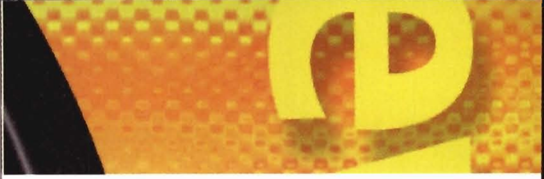
Speed Razor is a solid and feature-rich time-line-editing interface. Its multi-threaded design will take advantage of as many CPUs, and as much RAM as it can find; making it very efficient and increasingly more powerful whenever you upgrade your computer.

Version 4.5 SE is specially designed to take advantage of the Video Toaster's high performance capabilities. This means that functions, for example video scrubbing, are very fast and responsive. You can slowly drag the cursor through a transition, or scrub back and forth rapidly through a long project, and the Video Toaster will keep in step with you, outputting frame accurate display to your program out and/or ToasterVision display.

Speed Razor's interface is completely customizable. In fact, one thing Speed Razor is not short of, is user preference settings. Drag and Drop, Snap to, Trim, and Timeline are just a few of the areas that you can customize. If you like keyboard shortcuts, you be pleased to find 11 pages of them listed in the manual.

Real-time VGA preview of effects is another great plus, allowing you to see non-rendered previews of many of Speed Razor's effects, including: dissolves, wipes and titling. But once you get the appearance you are looking for, you don't have to wait long for it to render. Speed Razor has a lightning fast rendering engine: a one second dissolve can be completed in under 3 seconds, and even complex 4-layer effects are measured in minutes, not hours.





Aura VT

Among it's many other features are batch capturing, multi-track audio mixing/editing, 3D DVEs, chroma key, timecode, and video layering. It also supports many third party plug-in sets including: Boris FX, FilmFX, and HollywoodFX. Did we mention real-time changes in a clip's speed, fast or slow motion play-back without rendering?

LightWave VT

The Video Toaster (VT) version of LightWave is very similar in feature set to Inspire. Additionally, it supports uncompressed D1, field rendering, and video resolution. Also, video clips can easily be loaded and integrated with LightWave generated graphics.

Since most video editors would not need the advanced features of LightWave 3D, such as inverse kinematics, particles, volumetric lighting, and morph gizmo, these functions are absent. LightWave Modeler is also included, but with limitations such as only four layers, and no numeric inputs for objects and functions.

Most readers are already very familiar with what LightWave can do. So, we've only touched on the main differences here.

Aura VT

Aura VT has also been enhanced specifically to work with the Video Toaster. It is a traditional "paint" program, but with a lot more features, particularly ones of interest to videographers, such as: unlimited layering; roto-scoping; keyframe animation; color, chroma, luminance and alpha channel keying; and the ability to grab frames of video directly from the Video Toaster.

Like some of the earlier paint programs for the Amiga Toaster, you can paint directly on the program out monitor, which provides immediate feedback of how everything looks. You instantly know if you have used too fine of a line, or to small point size, or if the color isn't quite right.

Another great feature of Aura is the fact that you can change layer order and opacity, or even do things such as reverse play-back - all without having to re-render. A similar operation in After Effects or Premiere would require waiting for it to rerender the segment.

You can also apply Photoshop filters to any layer - and unlike Photoshop, Aura knows how to work with video fields. For example, when you apply a Ripple filter to video in Photoshop, it doesn't align the fields properly, and the result is not clean. However, using the same filter in Aura results in perfect alignment.

The Stroke Recorder allows you to record any brush stroke and play it back at any speed. This is great for doing things such as animating signatures - Just sign your name on a drawing tablet, and within seconds it can be animated. Also included, is powerful brush animation functions.

Aura also has a fully implemented scripting language called George, similar to ARexx on the Amiga. It allows you to create custom functions or to automate nearly any function in Aura. There are also transitions and effects that are built right into Aura, and even more are becoming available such as Visual Inspiration's Aura FX 3 volume set.

Most important, is that Aura takes advantage of system RAM to give you real-time playback, both to the computer monitor and to the program out.

What Does the Future Hold?

Of course, everyone wants to know about where the Video Toaster is headed in the future. NewTek already has several things in the works, including: an SDI card (currently being beta tested), DV I/O module (under development), AES/EBU digital audio I/O card, Multi-Input Switcher (previewed at NAB), and a Storyboard Editor (previewed at NAB).

Although the Video Toaster is capable of audio I/O, at this time a third party audio card is required. NewTek is currently working on enabling the two audio jacks

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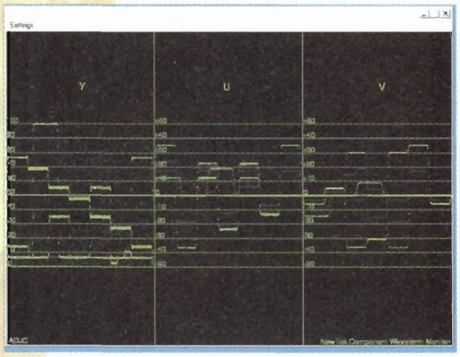

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LightWave 5.5+

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by
Jared Brookes

Texture Reference Nulls

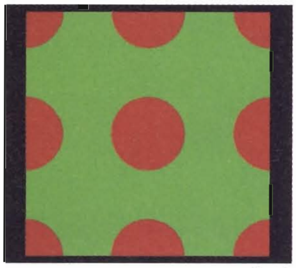


Figure 1

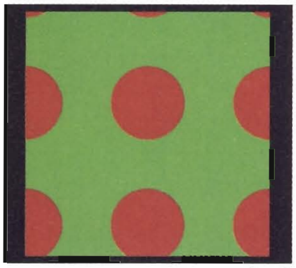


Figure 2

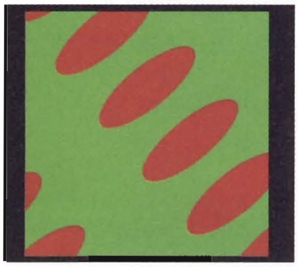


Figure 3

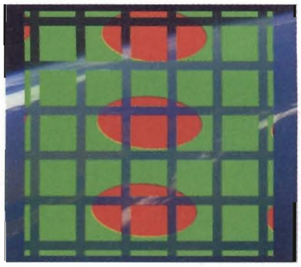


Figure 4

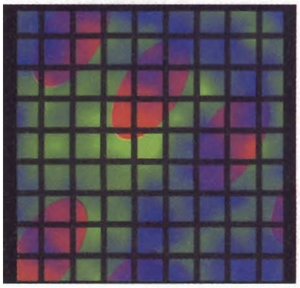


Figure 5

Texture Reference Nulls allow for a wide variety of effects, as well as adding to the flexibility of LightWave's texture-mapping system. What follows is an introduction to Texture Reference Objects, through the process of assigning a series of Reference Nulls to various texture channels on a basic rectangle object. These are animated over time, thus animating the textures themselves.

1. Start by going into Modeler, and selecting [Box] from the [Objects] menu. Click on [Numeric] and type:

	Low	High	Segments
X	-50 cm	50 cm	1
Y	-50 cm	50 cm	1
Z	0 cm	0 cm	1

Choose [Ok] to accept, and press [Enter] to Make the box object. Click on [Box] again, to exit box creation mode. Next, press [q] and give it the surface name "Ref Tester". Choose [Apply] to accept.

Choose [File] [Save As]. Create a directory in the "Newtek/Objects" directory called "Reference", and save this object as "RefTester1.lwo".

2. Load up Layout, and click on the [Objects] button at the top of the screen to open the Objects Panel. Select [Load Object], and double-click on the "RefTester1.lwo" object. Close the [Objects] Panel. Switch to [Camera View], by left-click dragging the view indicator at the top left of the screen. Select [Camera] from the Edit menu and press [n] for Numeric input. Move the camera to: X: 0, Y: 0, Z: -1.7 m. Click [Ok] to accept. Tap [Enter] twice, to keyframe it at frame 0

3. Let's set up Layout for render previewing: Open the [Render] panel, and choose some type of Render Display. I've chosen LW_QV. Click on [Camera] at the top of the screen to switch to the Camera Panel. Set Basic Resolution to something suitable. I've opted to use Medium Resolution (Video).

Now it's time to start playing around with Texture Reference Nulls. These work much like any other null object in Layout. They can be moved, rotated, sized, and stretched. An image map or texture can be parented to a Reference Null; so, when you translate the null, the texture moves or rotates in the same manner. Here's an example:

4. Switch to the [Surfaces] Panel, and make sure that "Ref Tester" is the Current Surface. Click on [Surface Color]. Set this to: R: 110, G: 240, B: 65 and click on [Ok] to accept.

Now we'll add a texture to our bright green square: Click on the [T] to the right of [Surface Color]. The Color Texture 1 panel pops up. Click on the scroll down menu next to Texture Type and choose "Dots". Select [Texture Size] and set it to X: .2 m, Y: .2 m, Z: .2 m. Since the object has no Z-depth, we really don't have to use any particular size value for Z. Choose [Ok] to accept.

Next, set the [Texture Color] to a bright red: R: 230, G: 40, B: 50. Click on [Use Texture] to accept these settings and close the Color Texture panel.

5. Press F9 and behold the amazing bright green square with red polka dots (Figure 1). Close the preview when done, and click [Abort] to return to the Surfaces panel

6. Click on the [T] next to the [Surface Color] button again. In order to manipulate the red polka-dot texture that we

added, we'll use a Texture Reference Null. Select [Add Reference Object]. You'll see "Ref Obj" app- ear in the Texture Reference Object section.

To rename this null object, click on [Objects] to open the Objects Panel (don't worry, the texture settings have been retained). Current Object should read "Ref Obj". In order to rename a null object, we need to use the [Save Object] button. This doesn't actually save the null object, since nulls are saved as part of the Layout scene file, and not as a separate object. However, this does allow for a way to rename the null.

Click on [Save Object] and give the null the name "Polka Dot Null". When done, select [Close Panel] to return to the main Layout screen.

7. Make sure that Selected Item is "Polka Dot Null", Edit is set to [Objects], and Mouse is [Move]. Then, press [n] for Numeric input, and use: X: 0 m, Y: 25 cm, Z: 0. Click [Ok] to accept.

8. Press [Enter] once, type 60, and [Enter] again to create a keyframe for this position at frame 60. Press [f], type 30, and press [Enter] to go to frame 30.

9. Press F9 for a preview. Note that the center is now shifted up 12.5 cm (or half the distance between the start position of Y=0 and Y=25 cm). The pattern is rising as the null rises (Figure 1).

Let's add some more translation to it:

10. Select [Stretch] from the Mouse menu and click on [Numeric]. Try these values: X: 2, Y: 0.3, Z: 1. The Z value can stay at 1, since it won't have any affect anyway. Click [Ok].

11. Press [Enter] twice to keyframe the horizontal stretch at frame 30 (since we're currently on frame 30).

In addition, we'll add some rotation. Click on [Rotate] and press [n]. Use: Heading: 0, Pitch: 0, and Bank: 90 degrees. Click [Ok].

If you scroll through the frames, you can see that the Texture Reference Null is stretched out to double its width by frame 30, and then returns to its original size at frame 60. As well, through the course of the animation, it rotates 90 degrees. This is exactly what's happening to the texture too.

12. Go to frame 45 and Press F9 for a preview (Figure 3). The dots have been rotated slightly, and stretched. Take a look at frames 15 and 30 too.

As you might have guessed, we can add these reference nulls to surfaces in different channels, as well as to textures on different layers. Let's try this...

13. Open the [Surfaces] Panel, and click on the [T] next to Transparency. This brings up the Transparency Texture 1 panel. Select [Texture Size] and set it to: X: .2 m, Y: .2 m, Z: .2 m. Then increase Texture Value to 80%. This will raise the transparency of any of the areas on which the grid lines fall. If you set Texture Value to 100%, the grid line areas will be totally transparent.

    Choose [Add Reference Object], switch to the [Objects] Panel, select [Save Object], and name this null "Transp Grid Null". [Close] the [Objects] Panel.

14. For the sake of interest, let's add a background image, so that we can see the transparency effect more easily. Click on [Effects], and then choose the [Compositing] tab. Next, click on the Background Image scroll down menu and select (Load Image).

Choose any image you like. The image that I used is called "MassFromOrbit_ Small.jpg" and it's located in "Content/Guests/Wheeler/Images/Planets/" on the LightWave CDROM. When you've loaded a background image, click [Close Panel].

    Select [Size] in the Mouse menu, and press [n] for Numeric input. Reduce the size of 'Transp Grid Null' to: X: 0.5, Y: 0.5, Z: 0.5. Click [Ok].

15. Select [Create Key], type 60, and press [Enter] to keyframe the half-sized null at frame 60.

Now, try doing a few preview renders. Figure 4 shows what frame 10 looks like. Finally, let's add an extra layer of texture:

16. Open the [Surfaces] Panel again and click on the [T] next to Surface Color. Choose [Add New Texture] to do just that, and select [Fractal Noise] as the Texture Type. Keep Texture Opacity at 100%, and change the Texture Size to: X: .2 m, Y: .2 m, Z: .2 m. Then, Set Texture Color to R: 55 G: 30 B: 232.

    Click on [Add Reference Object], and open the [Objects] Panel again. Use [Save Object] to rename this null "Fractal Noise Null", and [Close] the Objects Panel.

Feel free to animate this null any way you wish. Figure 5 shows the object with the texture at frame 50 - without the background image.

Finally, let's set this up for rendering:

17. Open the [Render] panel and click on [Save RGB Images]. A requestor will come up, asking you to select a directory to save the images in. Make a directory, and then type in a filename for the frames. Click on [Save] to close the requestor.

18. Set [Render First Frame] to 1, [Render Last Frame] to 60, and give [Frame Step] a value of 1. A [Frame Step] of 2 would render every second frame. Make sure that [Automatic Frame Advance] is enabled.

    In the [RGB Image Format] section, select the file type that you want the images to be. I like to use [24-bit Targa (tga)]. You could select [Save Animation] instead, and choose an animation format next to Animation Type.

    Click on [Begin Rendering], and soon, you'll have an animated example of Reference Object controlled textures.

Reference objects are also useful for mapping images onto an object at odd angles, or making objects teleport in or out of a scene (using the transparency texture channel). Feel free to experiment on your own.

Jared Brookes is a free-lance LightWave modeler/animator. You can email him at jaredbrookes@hotmail.com

AN ARTIST CAN NEVER HAVE ENOUGH TOOLS

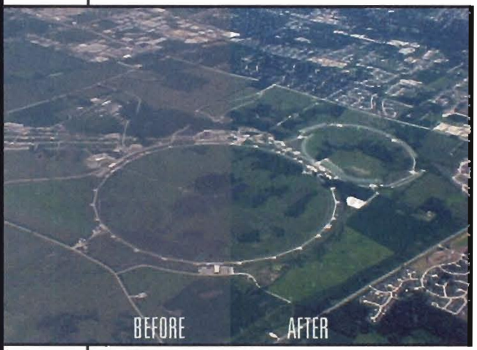
This article has additional
Online Content
www.newtekniques.com/bonus

by Ron Jensen
and dhomas trenn

FREE Plug-ins For Aura, ImageFX and Photoshop

Most artists like to have a lot of creative options when they are working. So, NewTekniques set out to find some new tools that our readers could have some fun with. Most importantly, we wanted our readers to have something special - to give them an artistic edge.

To achieve that goal, we needed something that would be exclusively available to our readers. So, NewTekniques teamed up with programmer Ron Jensen to make it happen.



This effort resulted in the creation of two very exciting image processing plug-ins for ImageFX. But, we wanted our non-Amiga readers to have some fun too, so Ron went back to the drawing board. After a little more experimentation, he was back with some filter plug-ins for Photoshop Aura that offered similar capabilities.

Without further ado, we are pleased to present you with LumiEssence and BiColorize - plug-ins created by NewTekniques, exclusively for NewTekniques readers. These plug-ins are available through the Download section of this issue's online bonus area. — *At the time this magazine went to press, we were having difficulty with MAC versions of these filters. If all went well, you should find them online, too.*

Aura

Aura directly supports the use of Photoshop filters, so refer to your Aura manual [Section 8.17], and to the Photoshop section below, for information about using these plug-ins.

Photoshop

The LumiEssence plug-in for ImageFX contains several different operating modes in one plug-in. In order to give similar functionality in Photoshop filters, it was necessary to create several different filters.

The filters whose names begin with Grey, result in grey-scale output. Names beginning with Color, leave the image in color.

The Bright filters feature two controls. The top one makes the image darker, the bottom one makes the image brighter.

The Negative filters create a negative image. The top slider makes the negative brighter, the bottom one make it darker.

The Middle filters function like the ImageFX version described below, with the Middle check-box enabled and the other two disabled.

LumiEssence

LumiEssence works by dividing the source image into 256 levels of brightness. It allows you to choose, via check-boxes, whether to include or exclude its shadow areas (Dark), the mid-tone areas (Middle) or the highlight areas (Bright) when creating the resultant image. Also, four sliders are provided to adjust where the transition between these areas occurs, and how sharp those transitions are. These controls interact as follows:

Shadow areas in the image start at 0 brightness and end at the brightness value set by the Dark slider. If you enable the Dark check-box, every pixel whose brightness value is less than the Dark slider will have the cor-

responding alpha pixel set to white, otherwise it's set to black

The Low-Mid slider sets the lower edge of the mid-tone areas, and the Hi-Mid slider sets the upper edge. Enabling the Middle check-box, will set the alpha channel pixel to white for every pixel whose brightness value falls between the Low-Mid and Hi-Mid sliders. Disabling it makes the alpha channel pixels black.

The Bright slider sets the bottom of the highlight area. The top of this area is always a level of 255. The Bright check-box works like the Dark and Middle check-boxes.

Setting the Dark and Middle check-boxes to opposites (one ON, the other OFF), creates the need for a transition between the two areas. The smoothness of this transition depends on the distance between the Dark and Low-Mid sliders. If you set Dark: 50 and Low-Mid: 51, the color will jump immediately from white to black. With Low-Mid: 55, four levels of grey will be used. Moving Low-Mid up, or moving Dark down, will create even more grey levels, and a smoother transition between the two areas. The difference between Hi-Mid and Bright, controls the transition between Middle and Bright in a similar fashion.

LumiEssence, has three modes of operation: Alpha, Grey, and Color.

LumiEssence: Alpha Mode

In the Alpha mode, LumiEssence creates an alpha channel mask, based on the grey weighted brightness of each color in an image. This can be very useful, for example, to increase saturation of shadows and mid-tones in an image, without affecting the highlights. To do that, you simply use LumiEssence in Alpha mode, to create an alpha channel with the isolated areas you want to effect. Then apply a saturation tool, using the alpha channel as a mask.

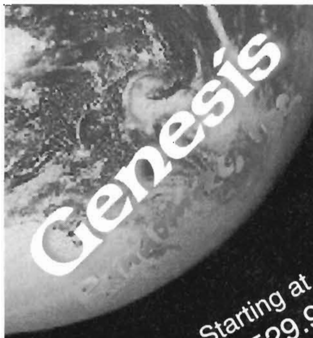
Among other things, this mode can do luminescence keying. While not as versatile as chroma keying, it might be useful in some situations.

BEFORE
AFTER

LumiEssence: Grey Mode

Grey mode works the same as the Alpha mode, but instead of creating an alpha channel, it directly effects the R, G and B channels - converting it to grey-scale. This is great for creating bump-map images for use with LightWave, or textures for ImageFX.

It can also do a good job of adjusting contrast on grey images. To darken an image,



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enable Bright and disable Middle and Dark. Set the sliders to: Dark: 1, Low-Mid: 2, Hi-Mid: 3, Bright: 255. Then, adjust the Hi-Mid slider upwards to darken the image. Or, you can brighten an image by enabling Bright and Middle and disabling Dark. Set the sliders to: Dark: 1, Low-Mid: 253, Hi-Mid: 254, Bright: 255. Then, adjust Low-Mid downward to make the image brighter.

If you apply similar contrast settings to a color image, this acts as a very controllable color-to-grey converter.

LumiEssence: Color Mode

In Color mode, the R, G, and B channels are processed separately. Instead of calculating a weighted average brightness, the value of each color channel is used separately to find a new value for that channel.

This mode can create some truly bizarre pseudo-color effects. Experiment with the Dark and Bright check-boxes enabled and Middle disabled - or the opposite.

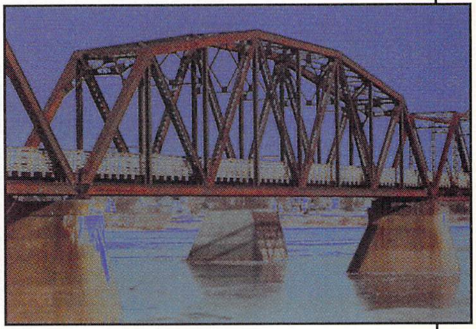
BiColorize

BiColorize is sort of a color mixer/blender. It works on both grey-scale and RGB source images, but you must convert grey-scale images to RGB first.

A simple example is the best way to explain what BiColorize does. In this example, we're going to apply BiColorize to an imaginary picture that only has one pixel in it. The pixel is brown (R:127, G:91, B:63) and the BiColorize parameters are set as follows: Color 1 - R:0, G:100, B:200, and Color 2 - R:255, G:255, B:255.

BiColorize first looks at the red channel of our single pixel, and sees that the value is 127. That's 50% of the way from 0 to 255; so it uses the color value that is 50% between Color 1 and Color 2's red values. So our resultant red value is 0+((255-0)*.50) = 127. It does the same for green: 91+((255-91)*.35) = 148, and blue: 200+((255-200)*.25) = 214. So our resultant color is R:127, G:148, B:214.

This plug-in is particularly good for creating color-tone (such as sepia) and negative effects.



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Toast Master Flying High

You don't always need to spend a lot of money to get the job done. Sometimes, the cheap solution is just as good.

MY STUDIO IS FULL OF GARBAGE

A Guide to Doing More For Less

by Bohuš Blahut

It's fun to thumb through video catalogs and ogle your next equipment purchases - that is, when you have a lot of money to spend. But, sometimes we have to stretch each dollar to the breaking point. I am convinced that copper wire was invented by two video producers fighting over a penny.

Many Toaster and Flyer users work within really tight budgets. So, when you do actually have money to spend, why not get more bang for your buck? Our studio isn't afraid to spend money where it's necessary; but what helps keep us going is knowing when to spend, and when to save. I'm equally at home shopping among the sleek racks of my local broadcast gear showroom, as I am "dumpster-diving" behind it.

$10 paid for the case and the camera. I bought it to get the case, but the camera is a great Crash-Cam — good for getting shots that you would never risk a more expensive camera to get.

Okay, my studio isn't really full of garbage - that's a bit of an exaggeration. However, we do have a lot of tools and gear that have been obtained for ridiculously low prices. So, let's take a tour of The Vantage Point and explore some of the fun stuff that Toaster and Flyer owners might make use of - and find out where to get it for less. The main rule here is to be cheap without looking cheap.

From the Hands of Neighbors

Most neighborhoods have a charity organized thrift store, such as the Salvation Army. These are surprisingly fantastic sources for props, tools, and even old video gear.

Flea markets, swap meets and garage sales are also a great opportunity waiting to happen. In just one summer of exploration, I amassed enough office furniture to build a second edit suite, with style. Marker Board: $10, stylish 1950's folding table: FREE - You get the idea.

These kinds of sales are a great chance to meet folks in your neighborhood - and when they ask "What are you going to do with THAT?", you can tell them, and maybe even leave them your business card (hint: always carry some business cards).

Another advantage is that you're usually getting the equipment and furnishings right from the folks who used them. There's usually little chance that what you're buying has experienced the battle scars that frequent rental equipment.

Recent finds include: Oscilloscope: $50, VHS rewinder: $2, shelving (really necessary after you've been doing this for a while): $5, mini television (field monitor): $25.

Go Where the Gettin' Is Good

Another good source for used equipment is rental houses. They often have gear that's just gathering dust, missing a manual, or in need of a minor repair. Rental houses usually keep very good records of the condition and repairs that their gear has been through. A couple of our local rental houses have annual sales to clear their warehouses of old gear.

Mini-DV video deck, camera, cables and more. All happily nestled within the protective confines of lunch boxes.

Here is a survey of some things I've bought: Junior movie light with stand: $125, Mackie 1404 mixer: $300, video camera stabilizer: $60, stereo equalizer $35, PortaBrace case for field monitor: $10, Sony RGB component Chromakeyer: $75, car mount for video camera: $45.

I stay in touch with the sales people at several rental houses, and I let them know what I'm looking for and how much I'm willing to spend.

Old to Them, New to You

As you know, to keep up with the evolving world of video production, you must upgrade gear. When professionals upgrade, they are often looking to get the old gear out of their studio fast. The physical space that unused equipment takes up often becomes more valuable than the gear itself. Also, many folks who get into the video business also leave it. While you don't want to kick a fellow businessperson when they're down, this is an opportunity to pick up some gear while helping out a fellow professional.

Deals I've made include a 16mm film-to-video transfer station from local PBS station: $150; low end Bogen tripod: FREE; one-time used S-VHS tapes: .80 each; drawing table: $25; animation light table, cels, cel paints: FREE; black generator: FREE; intercom system: $10; two broadcast quality turntables from radio station: $50; Toaster 4000 computer with monitor and Y/C Plus: $150.

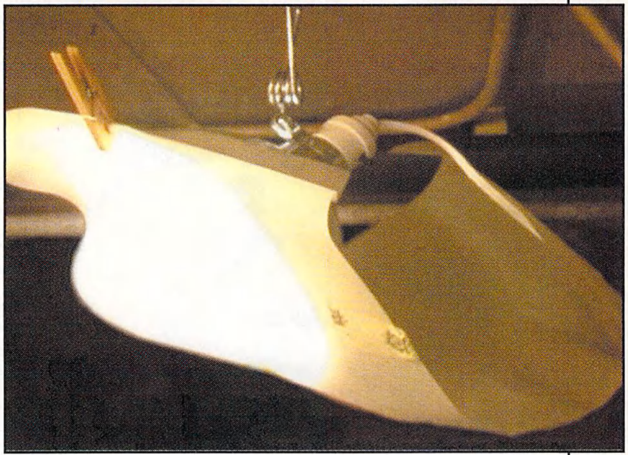
I could go on and on (pneumatic office chairs: $25) with all of the places (Rubbermaid portable desk: $10) that I've found exceptional deals (Bolex 16mm projector: $50); but the thrill of the hunt isn't for everyone. It does take some wherewithal to keep your ears attuned to the whispering of good deals to be had, or to sacrifice your summer Saturdays looking for garage and rummage sales, but it can turn out to be well worth the effort.

$7 Clamp light, equipped with $2 backyard floodlight bulb.

One Man's Lunch Box

Warehouse-type stores, such as Target and WalMart, are our next stop. These voluminous stores harbor aisle after aisle of good deals.

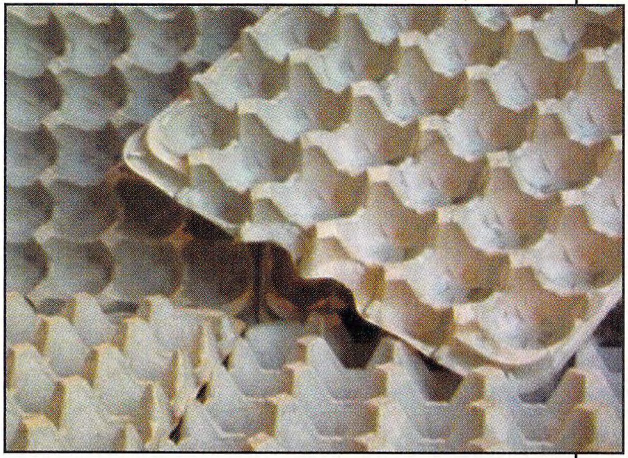
I'm a huge advocate of having cases for equipment. "A place for everything and everything in its place" has never been truer than when you're squirreling away your gear. Professional cases are available for just about everything, but often cost more than the item that you're keeping inside it. It's best to have your camera, and perhaps your lights, in custom fitted cases for maximum protection. But, what about the smaller stuff like microphones, adapters, and the countless other little things that make up your kit? The answers are down the camping supplies aisle.



Clamp light in action, with a C-47 holding diffusion.

These days, backpacks are rugged, and

Toast Master FlyingHigh



When used in numbers, these egg cartons can make great soundproofing.

loaded with lots of pockets and features that are perfect for working in the field. Some even have collapsible space, so that you can customize the size of the pack. Another nice feature is a detachable mini backpack.

You can also find some great just-in-case items, that you should keep in your production vehicle, such as collapsible camping chairs (always have extras ready for your crew and actors). Be sure to pick up a flashlight or two. My favorite is the Bite Lite - a slim flashlight made of soft rubber that turns on when you bite it - excellent for those times when you're crawling around behind equipment and you need both hands. There are also various velcro straps you can use, first aid kits, portable fire extinguishers, and roadside emergency gear - all good ideas for any on-the-road job.

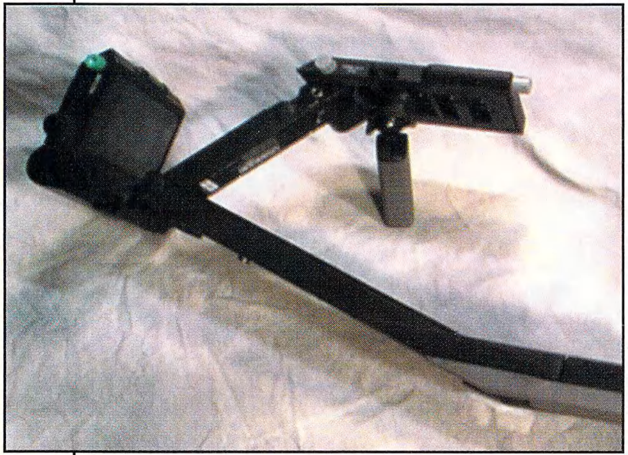
If you need a professional looking case for a mini-DV deck, 35mm still camera with lens, or other devices, the best place to look is down the isle of lunch boxes. Here you'll find padded nylon cases, with tons of features, such as cold/warm packs (good to keep your batteries warm out in the cold), web pockets (so you can quickly inspect what's inside), and hard-shell protection. If you've got some packing foam, you can easily customize these cases further.

There's also a wide selection of drink coolers. Whoa, are these great for gear! Many have hard shell protection, and most have some way of customizing the interior. These are great for carrying microphones and other gear. You also may want to get an extra one to, er, use as a drink cooler. You don't know how many producers' tired faces have lit up after I hand them a nice chilled drink in the middle of a long shoot.

Let There Be Light

Don't forget to stop by the hardware section and pick up some clamp lights. These lights are five to ten dollars, and make great fill lights. You can either set them up on dimmers, or have bulbs of several wattages on hand. Also, for around the same price, you can get halogen work lights on a stand, or clampable as well.

To get better control of your lighting, you'll need some gels and diffusion material. Gels are transparent colored sheets that you clip to the front of your lights to color the scene. DO NOT use colored cellophane, or you'll have a fire on your hands. Diffusion is a spun material that comes in sheets to soften the quality of light. Both are remarkably resistant to heat, and are quite expensive. But, these are very necessary, and they make the difference between a slick video, and one whose subjects are all squinting in the harsh glare.



$60 is a great deal for a video camera stabilizer!

I got most of my gels from the trashcan at job sites I worked. Don't worry about small holes or marks - you'll want to cut to size, anyway. You might try calling a few rental and production houses to find out if they have any scrap pieces.

I said C-47, not 747

So how do you get the gel to stay in front of the light? Well, of course you'll need some C-47's. To the layperson, they might look like wooden clothespins, but to the film and video industry folk they are C-47's. Why? The legend says that this is the way to help pad your budget - under "lighting gear" you list C-47's as costing several hundred dollars. There's your pizza party money for the end of the shoot.

Just clip the gel to the barndoors of your light, or wherever it's convenient. Note that there are two kinds of gel: theatrical and film. The theatrical gel is not as resilient to the heat, and has colors that are much more saturated - great for special effects.

By the way, if you reverse the parts of a clothespin, it's called a P-56. You can use this as a substitute for needle-nose pliers - great for fishing those hot scrims out of spotlights.

Saving the Best For Last

Other places where I've found some gems are surplus stores. Military surplus stores are easy enough to find, but military items have become trendy. You may end up pay-

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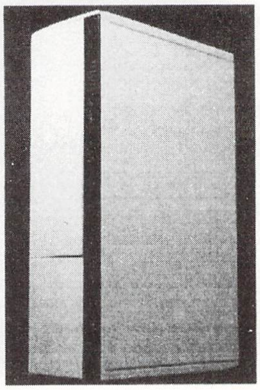

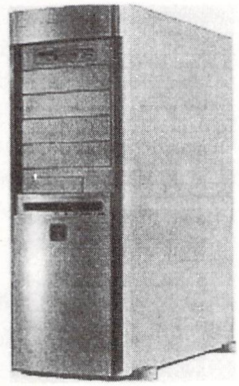

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Prices are subject to change without notice . Call for current pricing .We are not responsible for typographical errors. 15 % restocking fee for all items returned and not exchanged for same. Prices do not include shipping. PA residents add 6% sales tax. All warranties subject to manufactures terms and conditions . Lease subject to approval by Bankvest Capital .

Web #223

Surplus finds: $45 anamorphic lens, $2 spring clamp, and $25 video light with long lasting battery.

ing much more than something is worth these days.

Did you know that there are businesses that liquidate electronics surplus? You'd be surprised at the kinds of things you'll find there. They often have free catalogs, and many have Web sites that you can explore.

My favorite by far is American Science and Surplus. They have everything. I've been in their warehouse, and I swear that I saw several Arks of the Covenant. Any project that I work on starts with a visit to AS&S. I've found video lights: $25, spring clamps:.50, fish eye lenses removed from photocopiers (great for special fx): $2.50, even an anamorphic lens from a World War II gun camera (for that stretched out look in music videos): $40. Go to www.sci-plus.com or call 800-934-0722 and get their catalog.

$25 Portable color television, inside a $10 porta-brace case.

Another favorite is All Electronics Corporation. This is your one stop shop for every conceivable kind of cable or connector; you just have to be willing to build it yourself. AEC also has used Hi-8 and S-VHS tapes for about $3 a piece. Very good for experimenting with video techniques. Call 888-826-5432 or go to www.allelectronics.com.

Finally, you won't want to miss a visit to MECI. This is also a surplus electronics dealer; but they also carry finished products: surplus PC's, monitors, security cameras, circuit boards, carrying cases, speakers, and even store fixtures! www.meci.com or 800-344-4465.

Some More For the Encore

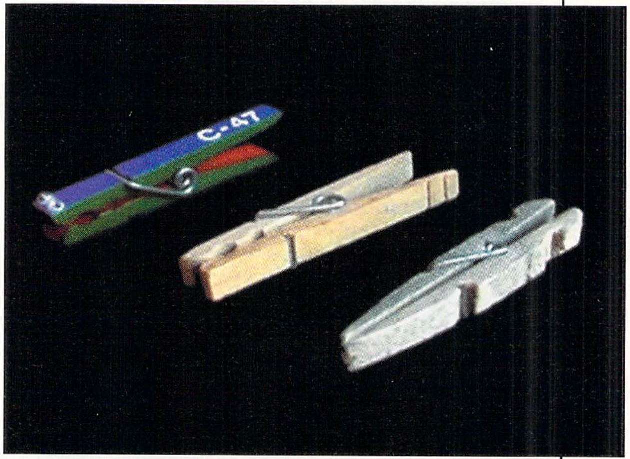
You want more? How about auctions? Occasionally, you'll come across video equipment auctions, but in my experience it's quite rare that you get a good deal. There's always a great time to be had at police auctions, though. They sell all kinds of gear that they've seized, equipment they're not using any more, and even furniture.

Need some soundproofing material? Talk to the folks at your local restaurants. When they order eggs, they get them in recycled paper trays that look like really big egg cartons. Just staple or glue them to your walls to help deaden echo.

Swap meets, anyone? You might be surprised at how much video gear you'll find at photography swap meets. This is a good place to find lights, tripods, filters, books and videos teaching how to compose shots, and sometimes video cameras. HAM radio swap meets are sometimes a good source for video gear too, since there are amateur radio guys who have branched off into amateur television.

Now, the Real Finish

When I started writing this, I didn't realize just how much "junk" I use in everyday work - it's become integral into the anatomy of my studio. Because of this frugal way of getting things done and amassing equipment, I've been able to build up The Vantage Point without significant debts. With a little time and just a little TLC, we've saved cash on vital production gear.


From left to right: The C-47 as found in the wild, the C-47's defensive camouflage as a common clothespin, a P-56.

Now, if I could only find someone selling a cheap basement or two, that I could build onto my studio. Then, I'd be all set.

Bohuš Blahut is the director of The Vantage Point and creator of the Catalyzer tutorial video series. You can email him at bohus@xnet.com

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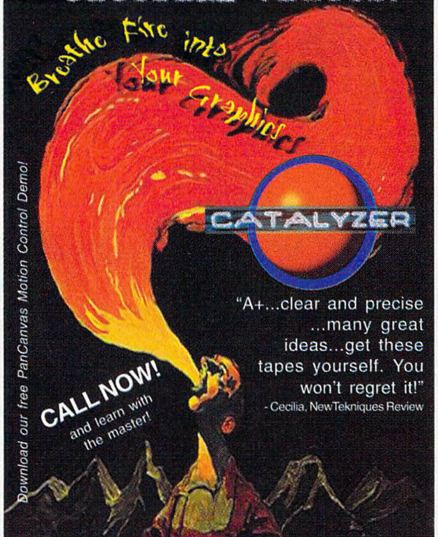
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100 ☐ Check this box if you would like to be added to the NewTekniques emailing list.

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110 ☐ I have a subscription
111 ☐ Newsstand / Bookstore / Dealer
112 ☐ Friend / Work

How often do you read NewTekniques?

113 ☐ Every issue
114 ☐ Occasionally
115 ☐ Not very often

Which of the following products do you use?

120 ☐ Aura
121 ☐ Inspire 3D
122 ☐ LightWave 3D 4.x
123 ☐ LightWave 3D 5.x
124 ☐ Video Toaster (Windows)
125 ☐ Video Toaster (Amiga)
126 ☐ Flyer (Amiga)
127 ☐ After Effects
128 ☐ ImageFX
129 ☐ Photoshop
130 ☐ Speed Razor

Will you buy LightWave 3D 6.x?

135 ☐ Yes
136 ☐ No

Will you buy the new Video Toaster?

137 ☐ Yes
138 ☐ No

Which of these computer platform(s) do you use?

139 ☐ Windows
140 ☐ Mac
141 ☐ Amiga
142 ☐ Alpha
143 ☐ Unix
144 ☐ Linux

Do you have internet access?

145 ☐ Yes, dial-up
146 ☐ Yes, cable modem
147 ☐ Yes, DSL/ADSL
148 ☐ Yes, T1/T3
149 ☐ No

Do you use your computer/software for business?

150 ☐ YES, full-time professional
151 ☐ YES, part-time professional
152 ☐ NO, only for personal use

What brand(s) of computer do you use?

160 ☐ Acer
161 ☐ Apple
162 ☐ Compaq
163 ☐ Dell
164 ☐ Gateway
165 ☐ HP
166 ☐ IBM
167 ☐ Intergraph
168 ☐ Maxvision
169 ☐ NEC
170 ☐ SGI
171 ☐ Sony
172 ☐ Tristar

What do you think of these regular columns?

1 Something else would be better
2 Sometimes interesting
3 Couldn't live without it

PRINT

200 Feature (Dick DeJong and Molly Dinkins) 1 2 3
210 First Words (dhomas trenn) 1 2 3
220 Flying High (Bohuš Blahut) 1 2 3
230 LightWave Tutorials (Scott Wheeler) 1 2 3
240 LightWave Tutorials (Dave Jerrard) 1 2 3
250 Mojo (Mojo) 1 2 3
260 Plugged In (Bob Hood) 1 2 3
270 Toast Master (Bohuš Blahut) 1 2 3
280 Wave F/X (Greg Nelson) 1 2 3
290 Visions (Tim Jenison) 1 2 3

ONLINE

300 Business Matters (Kevin Hanley) 1 2 3
310 The Idea Factory (Bob Ketchum) 1 2 3
320 Image Effects (Cecilia) 1 2 3
330 LightWave Fundamentals (Jared Brookes) 1 2 3
340 The Producers' Lounge (Kermit Woodall) 1 2 3
350 Silicon Alchemy (Dave Haynie) 1 2 3

What level LightWave tutorials are of most interest to you?

400 ☐ Beginner (I want to be told where every button is)
401 ☐ Intermediate (I know my way around the interface)
402 ☐ Expert (I just want the specifics of the technique)
403 ☐ None, I don't use LightWave

Would you like to see C plug-in programming tutorials for LightWave?

404 ☐ yes, I know how to program in C
405 ☐ yes, but I need to know how to program in C
406 ☐ no

What improvements would you like to see made to the Online Bonus area?

What improvements would you like to see made to the Online TekTicker news area?

If you could change one thing about NewTekniques, what would it be?

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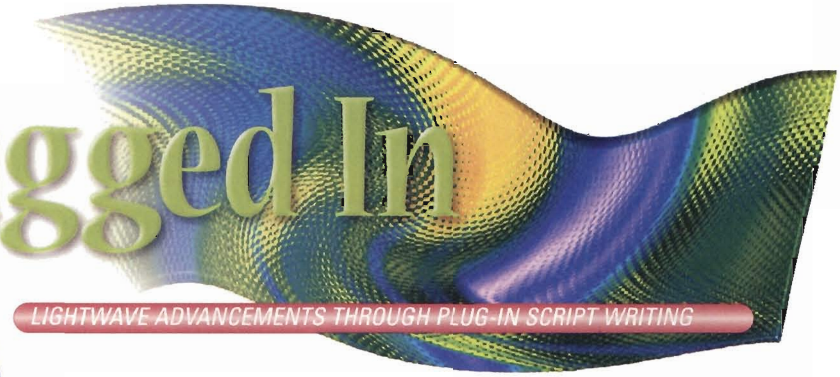
LIGHTWAVE ADVANCEMENTS THROUGH PLUG-IN SCRIPT WRITING

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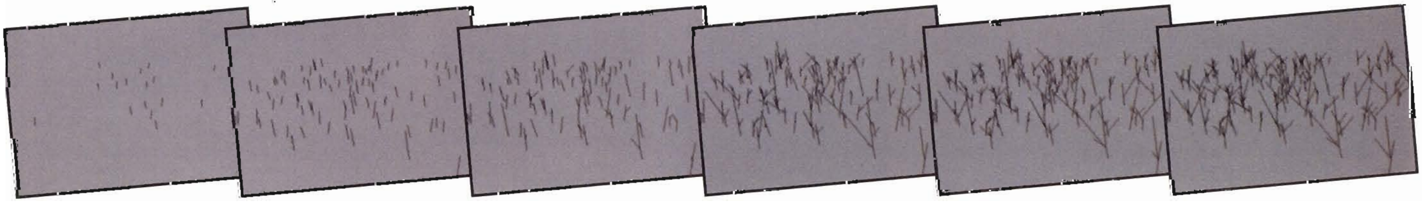
PROCEDURAL OBJECT REPLACEMENT

Tend Your Own Garden, Grow Your Own Weeds

If you have the right agent, you can generate on-the-fly geometry in LightWave Layout.

by Bob Hood

I have often heard LightWave users comment about their inability to generate geometry in Layout. Indeed, those who use Layout can only work with the mesh data that they have explicitly loaded (either directly or as the result of loading a scene). However, those of us who control Layout through scripting, have the ability to generate any geometry we wish. We just need to get ourselves a good agent.



Weed Is: Generating geometry in LightWave Layout

The Mesh Is Weak

Objects in Layout can be elastic-stretched and scaled away from their original shapes by keyframes or displacement mapping. Mesh can also be transformed using Layout's morphing mechanism, which is of course just another type of displacement mapping. However, with all of these different ways of distorting the points and polygons of an object, the core of the object's geometry remains unchanged. It continues to have the same number of points and polygons it contained when it was loaded. The only way to change the geometry of the object, is to replace it with another object of differing geometric quantities (and potentially, qualities).

Arguably, the least used plug-in architecture in LightWave Layout is the Procedural Object Replacement subsystem. This subsystem allows a plug-in to replace the object to which it is associated, on a frame-by-frame basis. Added to this power, is the fact that replacements are not restricted by conditions like those in object morphing. Objects that are used as replacements can completely differ from those they are replacing, in both mesh and attributes!

The Object Of My Direction

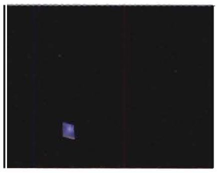
Object Replacement works by requesting of the plug-in/script a new filename at each new time/frame index. Layout will load the mesh data from the indicated file, and it will completely replace that of the object currently in the scene.

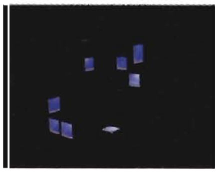
With this mechanism, it would be a simple matter to replace the mesh of an object at each frame of the animation, perhaps randomly selecting objects from a list. While this example lacks practical application, it does serve to illustrate three points about the Object Replacement mechanism. First, no dissolve envelopes are required, as would be the case if all the objects were in the scene at the same time. Second, only one of any of the objects is actually in the scene at any given time, providing potentially drastic reductions in memory consumption. Last, parenting is not required for motion; all objects are one, so the motion belongs to all.

Mesh Peddler

The original intention behind the creation of the Object Replacement plug-in architecture was to allow features like particle systems to be implemented in LightWave. While this type of feature has been implemented by other means, the Object Replacement architecture continues to allow geometry to be generated on-the-fly within Layout. In order to perform this magic, however, it helps to have a detailed knowledge of LightWave's object file format. This knowledge is key to creating new mesh data that can be loaded at each time index. Admittedly, this places quite a burden on the Object Replacement plug-in or script, but with power comes responsibility.

LScript supports a class of extension known as the Object Agent. Object Agents are native-code subsystems that provide knowledge and functionality not intrinsic to LScript. Knowledge may be provided about some aspect of the underlying operating system, functionality can extend to things like the processing of some proprietary file format or communication protocol.





Several Object Agents currently exist for use with LScript. Among them is an Object Agent called "ObjectMan" (short for "Object Manager") that offers a detailed interface for programmatically creating and managing LightWave's object files. As you can imagine, using ObjectMan with LScript's LS/OR scripting plug-in can considerably simplify the task of generating mesh data in "real-time". Let's see just how simple.

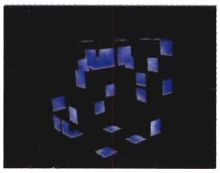
Grow Your Own Weed

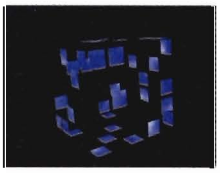
NOTE: Listing1.txt could not be included here, due to it's large size. The Listing1.txt, Weed.ls and ObjectMan files referred to here are available through the Download section of this issue's online bonus area.

Listing1.txt shows an Object Replacement script (Weed.ls) that will, given some help from ObjectMan, generate geometry in LightWave while an animation is produced. Because of the way the Object Replacement architecture was designed, you will only be able to see results with the script if you generate a preview, or actually render frames of animation.

Line 1 inserts the ObjectMan header file into the script. This header file contains definitions for use with ObjectMan. It also contains a line of code that provides the Object Agent linkage needed for us to use ObjectMan within the script. Object Agent headers can be lengthy, and space prevents me from discussing it here. I recommend you take the time to read through the header.

Lines 6-25 declare some global variables the script will use. On line 10, we create two variables that will contain requester control identifiers. Up until now, we have always created control variables local only to the options() function. However, we will need these two variables to be global for a good reason. More on that later.



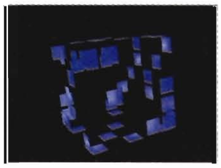


Lines 12-15 are the variables that hold the operational values of the script. The variables on lines 17 through 23 will hold various arrays used to generate and animate the weeds.

In the create() function (lines 27-42), we initialize the operational variables with default values. On line 38 in create(), we generate an instance of ObjectMan. The function ObjectMan() is not built into LScript, instead this is an example of the Object Agent constructor mechanism. LScript knows that an Object Agent of this name has been registered (through the header file). So, calling the Object Agent by name causes a new instance of that Object Agent to be generated; each call to ObjectMan's constructor will generate a new instance.

ObjectMan provides a means of creating and managing surface attributes as well as geometry, so we will provide the weeds with a simple surface definition. Because we will need to generate this surface each time the object is reset, we have stored the surface management code in its own user-defined function. We call this UDF on line 39, to assign the surface to the newly created object.

Up to this point, everything has been very typical, except for the last action on line 41: we invoke the script's options() function directly! We've never done this before, but it is perfectly valid. This will cause the requester panel to display instantly, appearing as soon as the script is activated. We do this as a reminder to the user that the script has operating values that they can modify.



Also new in this script, is the use of the destroy() function. Like create(), destroy() is a pre-defined call-back function known to LScript. It is invoked whenever the script (plug-in) is deactivated. We employ it here to remove any temporary files we have generated.

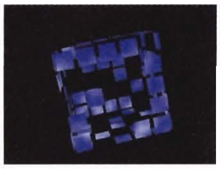
Professional Lawn Neglect

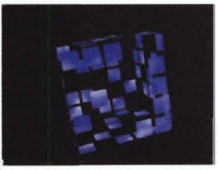
The process() function (lines 49-152) is the

By using the techniques described here, some very interesting things can be done. What is remarkable about this animation (aside from the fact that the object being generated does not exist prior to the start of the render) is that it is, in fact, one object. As such, the animated surface that is applied to it is a single suface across the entire object. If these individual panels were individual objects, you'd see the exact same pattern on each panel. As it is, the surface "clouds" move across each panel as a whole. The script and scene files used to create this animation are available online.

weed greenhouse. Before we begin nurturing these disreputable foliage, we check to make sure the working data has been initialized (line 51), and verify that we are progressing linearly (lines 53-59). Geometry is only added as frames of animation advance.

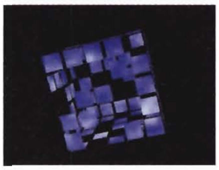
The main component of the process() function is a large loop (lines 63- 145) that iterates over each of the weeds. Weeds are constructed of a series of two-point polygons, or branches. Within the loop, we generate branches at pre-defined (but randomly generated) intervals. The `branch_watch' value is an indication that we have a branch that is in a state of germination. If this value is empty, then we seed a new branch (lines 65-81) Seeding is a process of looking for an empty branch slot in the `branch_vec1[]' array, and setting the index value of an available branch into `branch_watch'. Note that on line 76, we check to see if this is a child branch on the weed. If it is, then we remember the parent's growth point at the time of activation by placing this value into the `branch_event[]' array (line 77). We'll use this later as the starting point of the child branch, when its germination period has expired



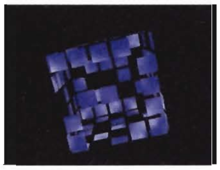


If `branch_watch' has a value, then a weed branch is germinating. The branch itself does not actually appear until it's pre-defined `branch_delay[]' value expires (line 105). However, before we deal with the delay for the current branch, we check to see if another branch already exists on the weed. If it does, then we take care of its growing needs (lines 83-103). The code in this section increases the length of the branch by a pre-defined value, contained in the `branch_growth[]' array, at each frame. (The code in this segment was taken directly from the "KaBob" project: April/May - June/July 1999).

The points for each branch are contained in the `branch_vec1[]' and `branch_vec2[]' arrays. These arrays are parallel, meaning that data at the same index in each array are related. To grow the branch, we need only move the point contained in the `branch_vec2[]', making sure it is aligned along the original vector created by both points. When we have determined the new position for the branch's outside vector, we simply replace its current value in ObjectMan's points[] array (line 99). We also have to make sure we remember the new location for the branch's next growing interval (line 100).



When a new branch is generated, we have to determine if it is the root of the weed (line 108). If it is, then its starting location, the vector in `branch_vec1[]', has to be determined based on our operating values. We first calculate the mid-point of the area where weeds will appear (line 110). This value is contained in the `max_area' value. We use this half-value to randomly generate a location within the area along the X and Z axes. This becomes the first of the two points of the root branch (line 115). The second point is calculated by using a constant of .25 meters on the Y axis, and a random variance of .10 meters for the remaining axes.



If, on the other hand, this is not the first branch on the weed, we need to position its first point somewhere along the parent branch. The value we remembered on line 77 will serve as the first of our two points (line 124). The second point is generated as a variance of this location (lines 125-130).

Once we have the point locations, we use ObjectMan to create new point entries in our working object (line 133). We also generate a new polygon in the working object to which the points will be associated (line 134), because without polygons, points will not be visible in Layout. We then assign the points to the polygon to generate a visible branch on the weed (line 135).

Finally, for each weed, we remember the two vectors that represent the branch by placing them in the `branch_vec1[]' and `branch_vec2[]' arrays (lines 137 and 138). The `branch_watch' value is also reset (line 142) so that a new branch can be generated.

Once all of the weeds are processed, we have ObjectMan save the new mesh data on line 149, and make sure the Object Replacement system has the correct filename (line 150).

Options With A Twist

The interface code in options() is, for the most part, familiar to regular readers of this column. However, there are a couple of differences that are worth noting.

First, global variables are used for some of the control identifiers. The reason for this, and the second difference, is that we are using an interface callback function (introduced in LScript v1.4). The ctlrefresh() function establishes a callback to the reset_object() UDF. Whenever the "Reset" control (line 175) is clicked by the user, this UDF is invoked by LScript.

In the reset_object() function (lines 233-246), we make sure the working object has its geometry reset so that another run can be performed. It is interesting to note that we use the ObjectMan instance to actually generate a "Null" object for Layout to load (lines 238-240). Null objects are not just concepts within Layout's code, but can actually be LightWave object files. Also note, that we use the global variables that hold the control identifiers to make calls back to the requester mechanism on lines 235 and 248.

The Proof Is In The Weeds

I'm not sure how useful the "Weeds.ls" script will be to LightWave users. However, the result of this exercise has been more proof than practicality: Geometry can be generated in Layout. Just as in Hollywood, the right agent can make all the difference.

Bob Hood is a Senior Software Engineer at NewTek.
You can email him at bhood2@home.com

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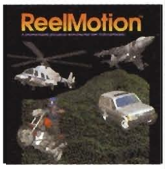

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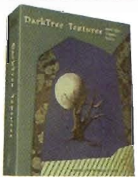

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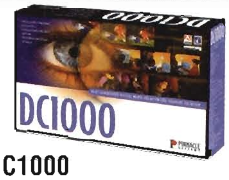

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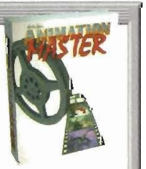

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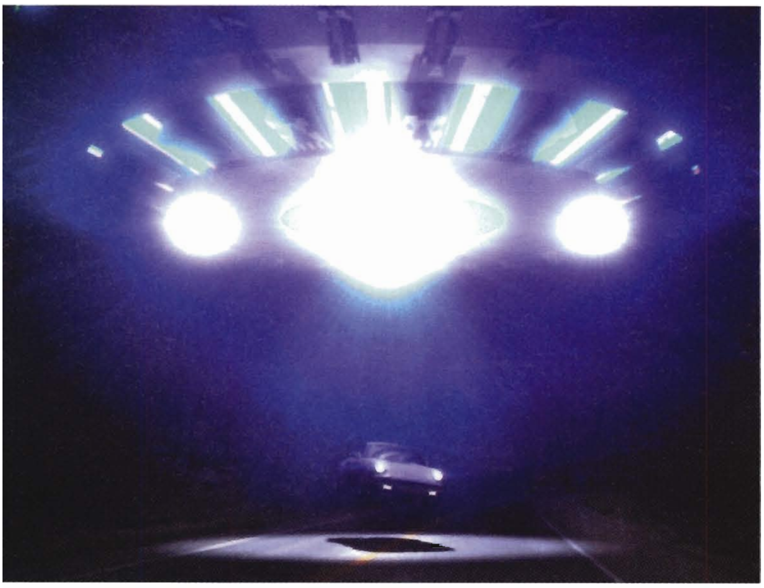
ALIEN ABDUCTION: THE GRAND FINALE

So, here we are on the last leg of our journey in LightWave 301. We went a long way towards completing our project last time, so all we need to do in this session is put the finishing touches on the whole project.

You're now just 10 steps away from the big finish. It won't be long now!

We'll be using the Steamer plug-in to create a light beam that will lift the vehicle up into the UFO. Steamer is a very complex plug-in, so we will just be scratching the surface of its capabilities. I encourage you to delve deeper into Steamer, its well worth the time you spend with it.

Last issue we added the lighting scheme to the scene. One of the lights that got added was called "HoldBeam". This is a spot light projecting down onto where the ground would be. We will be using this light as our Steamer light, as well as the primary illumination for the unfortunate car and its driver that are being abducted. One thing you will notice when you render the scene as it stands now, is that the spotlight does not illuminate the ground at all. This is because there is currently no geometry for the light to interact with



NOTE: Files required for this part of the tutorial are available from the Downloads section of the online Bonus area.

1. To get back to where we left off, load the "Abduction.lws" scene. Then, load in the "SpotLightGround.lwo" object that has been provided for you.

This object has two images associated with it, that have also been provided. One of them is the "Mountains_Day.iff" image, which we started using for the background of our scene, and the other is called "SpotTrans.iff", which should look like Figure 1.

NOTE: I have provided the "SpotLightGround.lwo" object, rather than having us build it together. At this stage in the project, you likely wouldn't find any added value in discussing the creation of a disk.

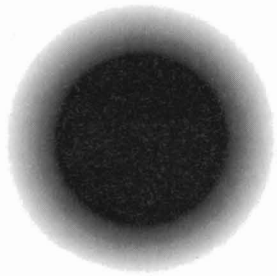


Figure 1

If you take a look at the surface for the "SpotLightGround.lwo" object named "SpotLightGround", you will find several interesting things about it. First, the Color Channel is a Front Projection Map of the "Mountains_Day.iff" image. Since front projected surfaces line up exactly with the background, we can use the "Mountains_Day.iff" image to make it appear as though the spotlight was illuminating the dark ground. If we were to use the "Mountains_Night.iff" image, it would only give us a slightly brighter version of the ground - and not look right. The effect we are looking for is a brilliant light projected down from the ship. This object, in conjunction with the areas we left lighter in the night image, will blend together as scatter light from the spot and the UFO.

The next element to look at is the Transparency Channel. Here is where we are using the "SpotTrans.iff" image. If we did not make an attempt to blend the edges of the disk out into the background, we would be left with a harsh edge where the disk ended. Additive is also used with this surface to help with the blend into the background. Without additive mixing on the surface, we would be left with a dark edge.

Last but not least, a small bump is applied to give the surface some roughness. It's not very apparent in the final render, but I use it to add a touch more realism. You might not see it, but you can feel it.

2. With the surfacing under control, let's render an image at frame 0 to see how the addition of our spotlight has changed the scene. Your image should look like Figure 2.

3. Now that we have taken care of the ground, we can turn our attention to the light beam. We will be using Steamer for this, but before we do that, we need to add a null object. Open the [Objects] Panel and select [Add Null Object] to place a Null in the scene. Rename the Null by clicking on [Save Object] and entering "SteamerREF_(NO)". Close the Objects Panel [p].

4. We will be using the "SteamerREF_(NO)" object to define the motion and size of the mist which will be passing though the steamer spotlight. Create the following Keyframes:

	Frame 0	Frame 240
Move		
X:	0	1 m
Y:	0	2 m
Z:	0	.5 m
Rotate		
H:	0	-10
P:	0	-15
B:	0	0
Stretch		
X:	2	2
Y:	5	5
Z:	2	2

This motion will give us a slow moving mist, with a tiny bit of spiral on it since our Null has a little bit of rotation. You will also notice that the Null is taller than it is wide, this will give the mist a more vertical character.

5. With our Null in place, we can move on to the light beam. Open the [Effects] Panel and select Steamer as the first entry in Pixel Filter Plug-ins. We will also be utilizing a speed enhancement for Steamer called Steamer_Doubler, so we need to add that to the second Pixel Filter Plug-ins slot. Your Effect Panel should now look like Figure 3.

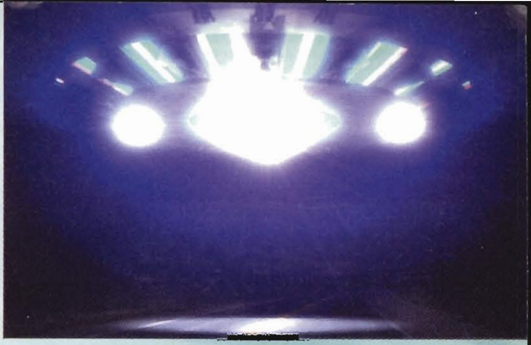
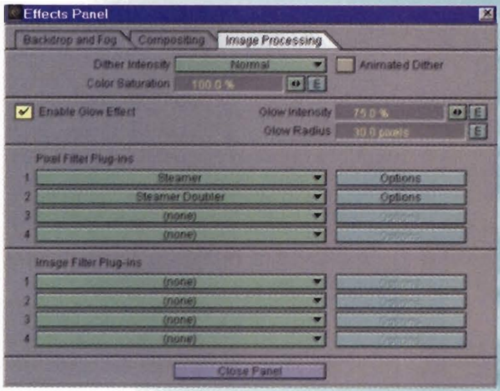


Figure 2



Dither Intensity: Normal
☐ Animated Dither
Color Saturation: 100.0 %
☑ Enable Glow Effect
Glow Intensity: 75.0 %
Glow Radius: 30.0 pixels

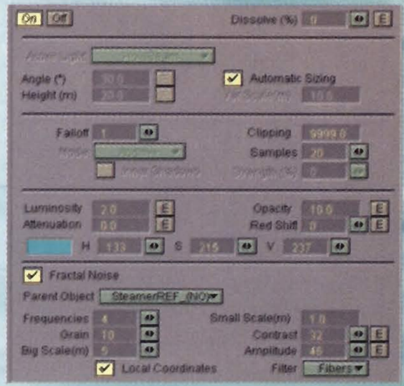
Pixel Filter Plug-ins
1 Steamer — Options
2 Steamer Doubler — Options
3 (none)
4 (none)

Image Filter Plug-ins
1 (none)
2 (none)
3 (none)
4 (none)

Figure 3

6. Select [Options] for Steamer to open the Steamer Panel. Before we do anything with our light, we should setup how we would like Steamer to render. We have already activated Steamer_Doubler in the Pixel Filter Plug-ins, so to get that to work for us we need to tell Steamer to render at half of its normal resolution. We do this by checking Render 1/2 Res. Another time saver, is to have Steamer render the entire effect only once, and then reapply it to consecutive antialiasing passes. We do this by checking No Antialiasing. This means that if we turn Motion Blur on for a scene, the Steamer effect will not be motion blurred. For most things this is not a problem, but some scenes will require that you add blur to the steam.

7. Next, let's define the light we will be using. In the [Edit Light] popup, select "HoldBeam" and click on [Activate]. You will get a warning about it taking longer to render with shadows, just click past that. If we didn't have shadows on, we would not get the cool volumetric effect that we want for when we add the car to the interior of the beam. If you click the [REFRESH] button under the preview window, you can see how the default settings aren't very complimentary to the light beam. Refer to Figure 4, and set the settings as indicated to get a nicer looking beam.



Dissolve (%): 0
Angle (°): 30.0
Height (m): 20.0
☑ Automatic Sizing
Falloff: 1
Clipping: 9999.0
Samples: 20
Luminosity: 2.0
Attenuation: 0.0
Opacity: 10.0
Red Shift: 0
H: 133 S: 215 V: 237
☑ Fractal Noise
Parent Object: SteamerREF_(NO)
Frequencies: 4
Grain: 10
Big Scale(m): 5
Small Scale(m): 1.0
Contrast: 32
Amplitude: 46
☑ Local Coordinates
Filter: Fibers

Figure 4

Now that we have the numbers plugged in, let's go over some of the parameters here:

With Falloff, the higher the positive number, the more abbreviated the beam will be. If the numbers are negative, then the beam will start at a distance from the light origin. I am sure that there is some formula or logic to how this works, but I just play with it until

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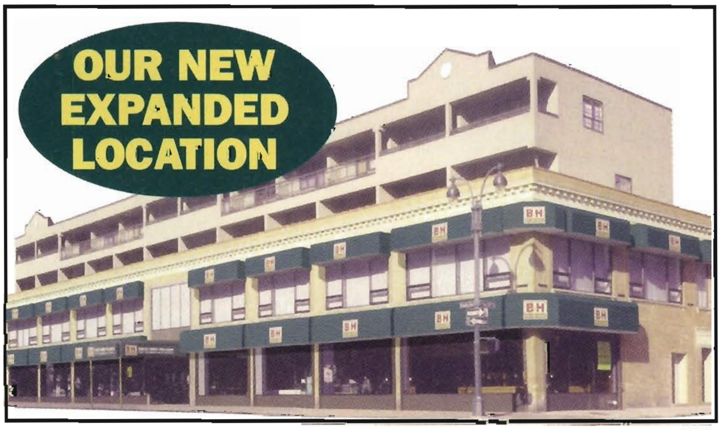
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QUICK DIAL 74

SONY

DCR-PC1 Miniature DV Camcorder

- Sony's smallest DV camcorder ever, yet still feature packed and with the same excellent quality
- 1/4" 680,000 pixel CCD imager designed specifically for DV picture quality
- Equipped with Carl Zeiss 10X optical precision zoom lens for unparalleled detail and clarity. Also offers a 120X digital zoom
- 5 Lux minimum illumination
- Crystal clear still/slow motion playback
- Edit search allows you to review the last several seconds of video without leaving the camera mode
- 7-mode Program AE allows for proper exposure and image quality in a variety of situations: Soft Portrait, Beach & Ski, Sports Lesson, Landscape, Spotlight, Sunset & Moon, and Low Light
- 16:9 wide mode allows you to record and playback in a 'widescreen' aspect ratio

DCR-TRV900 3-CCD DV Camcorder

- Three CCDs with 380,000 pixels each for excellent color fidelity and higher S/N ratio
- Progressive Scan CCD delivers clean edges and an overall sharper picture for still images
- 12X optical and 48X digital zoom lens
- 4-lux minimum illumination
- Analog recording capability lets you record from analog sources like Hi8 & S-VHS and master onto DV cassettes
- Zebra pattern indicator for over exposure, and color bar generator for properly adjusting your monitor
- Interval and frame recording for single frame recording and time-lapse effects
- Up to 8 hours recording time with optional NP-F950 InfoLithium Battery
- Crystal clear still/slow motion playback
- Intelligent accessory shoe provides synchronized operation of lights and microphones, automatically
- LaserLink system provides wireless connection of up to 16-feet between the camcorder and TV (requires optional IFT-R10 receiver)
- 5-mode Program AE for proper exposure in a variety of situations: Aperture priority, Shutter Speed priority, Sports Lesson, Sunset & Moon, Low Lux

Memory Mode:

- Memory mode allows you to capture still images and save them to a floppy disc (with supplied adapter), or an optional Memory Stick. You can also automatically copy all of your still images from your mini DV cassette tape directly to a floppy disk (w/supplied adapter)
- Capture images in JPEG file format with a choice of three different quality modes: Standard, Fine, and Super Fine. Save in JPEG format where they can be viewed on any Mac or PC. When you open the images, you will see large 640 X 480, 24-bit color detailed shots
- Date/Time stamp automatically writes the date and time to the file information
- Delete/Protect function allow you to save your favorite shots or delete undesirable ones
- Continuous record mode allows you to capture 4 shots successively in just a few seconds
- Index mode lets you preview six thumbnails at a time. Create a slide show of your favorite shots for playback

Canon

XL-1 3-CCD Camcorder with Interchangeable Lens Mount

With 3-CCDs, exclusive interchangeable XL Lens Mount System, unmatched optical technology, SuperRange Image Stabilizer, DV and simultaneous four channel audio recording, the XL-1 offers unmatched image quality and shooting versatility.

Interchangeable XL Lens Mount System

- Interchangeable XL lenses for unsurpassed flexibility and multi-coated optics to achieve 600 lines of resolution.

16:1 Optical Zoom with SuperRange Image Stabilizer

- The 16:1 has a focal length range of 5.5 to 88mm (35mm equivalent of 39 to 633mm). It offers variable speed zoom, manual zoom and manual focus control and has a one-push auto-focus button and built-in 1.5X ND filter.
- The SuperRange Optical Image Stabilizer uses a motion vector to examine the image after it is received by the CCD to detect any shake.

Digital Audio

- Three digital audio modes (16 bit and two 12 bit modes) and simultaneous recording of four separate tracks. You can output each signal independently.
- Audio inputs with independent level controls.

3-CCDs

- Three 270,000 pixel CCDs with advanced Pixel Shift technology achieves 530 lines of resolution.
- Large 72 micron CCDs deliver a 4dB improvement in sensitivity.

Three Recording Modes:

Unique Design & Dual Action Carrying Handle

Additional Features:

- 180,000-pixel color viewfinder
- Automatic and manual white balance, gain (five preset levels from -3 to +12dB) and exposure lock.
- Zebra pattern and color bar generator
- Composite, S-Video output, DV (IEEE 1394) in/out, Control L
- Digital fader and wide screen TV effect
- Headphone jack with level adjustment
- Remote control with jog/shuttle dial

NEW!

GL-1 The First Digital Video (DV) Camcorder with PRO L-Series Fluorite 20X Zoom Lens

Building on the company's design heritage in professional 35mm photographic and broadcast TV lenses, the GL1 is equipped with Canon's exclusive L-Series Fluorite 20X optical zoom lens and 3 CCD image sensors, offering outstanding imaging power in a lightweight, portable design. In addition the GL1 also incorporates the world's first 20X optical zoom. With the cameras ability to extend to a 100X digital zoom, users can increase magnification too distant to be seen with the eye alone.

Encompassing the design characteristics of a consumer camcorder with its compact size and 2.5" flexible LCD view screen, color viewfinder, the GL1 is also equipped with much of the same functionality that attracts newscasters and independent filmmakers. By extending broadcast-quality DV technology to prosumers, Canon is bringing high-quality video production capabilities to homes and small businesses. For users interested in visual computing, this FireWire IEEE 1394 compatible camcorder is ideal for producing QuickTime movies and creating images for distribution via the Internet. FireWire is one of the fastest peripheral standards in the DV industry, offering 30 times more bandwidth than USB, allowing for high-speed desktop video editing and display.

- Professional L-Series Fluorite Lens - a material that provides outstanding resolution, contrast and color reproduction and minimizes color aberration, especially in high-magnification lenses.
- 20X Optical Zoom - At a 35mm focal length equivalent of 40 - 806mm, the 20X optical zoom transforms distant subjects into, dramatic close-ups.
- 100X Digital Zoom - capable of extending between 40X - 100X. At full telephoto, the 35mm focal equivalent is 80-600mm.
- Optional WD-58 Wide-converter - will increase by 0.7X, 28mm in 35mm focal equivalent, for indoor shots or panoramic views.
- Optical Image Stabilization - eliminates image shake due to a wide range of movement and/or high wind conditions.
- Three Shooting Modes -Frame Movie mode allows users to record high-speed action at 30 fps. - Normal Movie mode delivers more than 500 lines of resolution - Digital Photo mode, with self timer, captures more than 700 still frame images on a single 80-minute cassette in SP mode. For SLR-style flash photography, the digital photo mode will accommodate a selection of Canon's speedlight flashes, including the 220EX, 380EX or 550EX.
- Direction Accurate Microphone.
- Programmed AE - Offers seven advanced recording controls -Full Auto Green Zone -Auto Mode -Manual Mode -Spotlight -Sand & Snow -Shutter Priority/Aperture Priority
- Picture Adjustment Supports -Camera Sharpness adjusts picture sharpness before recording.

Panasonic
Broadcast & Television Systems

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AG-EZ1 3-CCD Digital Video Camcorder

- Digital recording delivers 500 lines of horizontal resolution with no noise. (S/N ratio is 54dB).
- 10:1 power and 20:1 digital zoom lens. Both zooms are adjustable in four speeds (3.5-15 sec.) For extreme close-ups the lens can focus up to 1/4" from the subject.
- Two digital audio modes, choose between two-channel 16-bit stereo recording or two sets of 12-bit stereo.
- Huge 1.5" 180,000 pixel color viewfinder with 400 lines of resolution displays all functions on demand.
- Digital Electronic Image Stabilizer (DEIS) compensates for jittery video. Particularly effective when the digital zoom is employed.
- Variable speed shutter from 1/60—1/8000 of a second
- Built-in SMPTE time code generator.
- Digital Photo-Shot lets you record a still-frame for six seconds, while audio continues as normal. 290 still pictures can be recorded on a single 30-minute tape. TopScan function finds any shot easily.

$1995

AG-EZ30 World's Smallest 3-CCD Camcorder w/IEEE1394 Interface

The AG-EZ30 combines 3-CCDs and the DV format to deliver a level of picture and sound quality that makes it one of the most advanced camcorders of its kind. Weighing just 1.5 lbs. this incredibly lightweight camcorder also incorporates a large 2.5-inch color LCD monitor and has a host of sophisticated auto functions as well full manual control when required.

- 3-CCDs (270,000 pixels each) with a large light-collecting area give the camera high sensitivity and wide dynamic range. Double-density pixel distribution and a gapless dichroic prism further ensure razor-sharp images and extremely faithful color reproduction.
- Selectable 2-channel 48 kHz/16-bit or 4-channel 32 kHz/12-bit PCM audio recording.
- Built-in stereo mic and external mic input as well.
- 180,000 pixel, 2.5-inch color LCD monitor. Also has a 0.5-inch color viewfinder.
- Digital Image Stabilizer for clear, shake and jitter free shots.
- 12X optical zoom as well as 30X and 120X digital zoom functions. Move from wide-angle to full zoom in 1.3 seconds allowing quick framing while in REC pause.
- Offers six digital effects: Wipe, Mix, Strobe, Gain-Up, B&W and still mode.
- Large-diameter focus ring enables a high level of focusing precision. A Multi-Function Push Dial allows easy setting of the 16-step iris, 5-step gain control (+12dB maximum) and 14-step shutter (up to 1/8000 second). Mic input level can also be set in steps (-20/-10/0/+3/+6 dB).
- Five program AE modes for shooting in a variety of different conditions. There is also a five-mode white balance: Set , Fluroescent, Auto, Indoor and Outdoor.

NEW!

JVC

GY-DV500 1/2-inch 3-CCD Professional DV Camcorder

The world's first DV camcorder designed from the ground up for professional ENG work, the GY-DV500 combines the convenience and cost-effectiveness of Mini DV with the performance and features you need. It incorporate three 1/2-inch CCDs for superior picture performance (equivalent to 750 lines of resolution) superb sensitivity of F11 at 2000 lux and minimum illumination of 0.75 lux (LoLux mode). Ruggedly constructed with a rigid diecast magnesium housing providing the durability professionals crave, the GY-DV500's compact design and light weight (lesss than 11 lbs. fully loaded) makes it extremely portable. Additional features like the menu dial and Super Scene Finder assure ease-of-use and shooting flexibility, while the IEEE1394 and RS-232 interface allow integration into various non-linear and post-production systems. A professional camcorder in every sense, the compact, lightweight GY-DV500 redefines acquisition for corporate, educational, cable and broadcast production, as well as wedding videography and multimedia applications.

Professional Specifications

- Applies JVC's DSP with advanced 14-bit video processing to bring out more natural details, eliminate spot noise, accurately reproduce dark areas, and restore color information in dark areas.
- Three high-density 1/2" 380,000 pixel IT CCDs ensure the best possible image quality.
- CCDs are equipped with advanced circuitry to virtually eliminate vertical smear when shooting bright lights in a dark room. Ensures efficient light conversion with a sensitivity of F11 at 2000 lux.
- CCD Defect Correction function evaluates white defects with the lens closed and then stores their addresses in memory. When the camera is turned on, the data is sent to the DSP for storage and real-time correction.
- Black Stretch/Compress function ensures accurate reproduction of black areas on the screen. Advanced color matrix circuits give even difficult images a very natural appearance.
- Multi-stream parallel digital pipeline processing at 40 MHz creates an ultra-smooth gamma curve, calculated using a true log scale algorithm. The result is a dynamic range of 600% to accurately reproduce fine details and colors in shadows or highlights.

Professional Performance

- When activated, the Lolux mode increases sensitivity with almost no increase in noise. Lolux lets you capture high-quality video footage with excellent color balance at just 0.75 lux minimum illumination.
- Multi-zone iris weighting system gives priority to objects at the central and lower portions of the picture for accurate auto exposure under any condition, even if a bright subject moves into the picture.
- Adjustable gamma for adjusting the "feel" of the picture according to taste. Adjustable detail frequency for setting picture sharpness for a bolder or finer look.
- Viewfinder status display uses characters and menus to diplay selected information, including audio indicator, tape and battery remaining time, VCR operation and warning indicators. Camera settings and setup parameters can also be checked at a glance. A built-in menu dial lets you quickly navigate through the viewfinder menu.
- Highlight Chroma Processing maintains color saturation in highlights. The result is natural color reproduction, even in bright highlight portions of the picture.
- Smooth Transition mode ensures a smooth transition with no jump in color or light level taking place when manually changing gain or white balance settings

Professional Audio

- To complement its superior video performance, the GY-DV500 offers outstanding digital PCM sound. You can choose between two 16-bit 48-kHz channels or two 12-bit 32-kHz channels with a dynamic range of 85 dB.
- In addition to camera mounted mic, has two XLR-balanced audio inputs with 48v phantom power and manual audio control.Phantom power can be switched off when not in use.
- Side-mounted speaker lets you monitor audio in playback and recording modes without headphones. The speaker also delivers audible warnings.

Compact and Lightweight

- Measuring 10-7/8 x 9-11/16 x 5-1/8 the GY-DV500 amazingly enough is almost half the size of the GY-X2B. Weight is carefully balanced for ease of use in an ENG environment and extended shooting.
- Consumes less than 20 watts of power, eliminating the need for cumbersome and heavy, large-capacity battery packs.

Automatic Functions

- Full Auto Shooting (FAS) mode for point-and-shoot ease of operation. You simply zoom and focus. Activating the Full Auto Shooting sets the camera to the Auto Iris Mode, even if the lens is set to manual. Automatic videolevel control (ALC) is also activated, along with Extended Electronic Iris (EEI) and Full Auto White, which provide both variable gain and variable shutter. Shoot continuously from a dark area to a bright area without changing Gain, Iris or ND filter.
- ALC (Automatic Level Control) with EEI (Extended Electronic Iris) for continuous shooting in all light levels — no need to switch gain settings or ND filter.
- Continuous Auto Black (CAB) circuit assures perfect Black Balance in a changing environment without having to interrupt shooting.
- Accu-Focus activates the electronic shutter for approximately ten seconds, forcing open the Iris. A s a result, the depth of focus is minimized, and the lens can be focused quickly and precisely.

Conveniences

- Time code and index IDs allow frame accurate non-linear editing and mastering on standard formats with quick easy access to any target point.
- LCD display system let you switch or set functions, while referring to the counter or the on-screen display. Mode selection and initialization are also available via the menu display. Back-lit display supports shooting in dark areas.
- Back tally lamp lights to let you know that the camera is entering the Record mode. It flashes during the transition to the Record mode and when an error is detected in the camera.
- Variable Scan function allows flicker-free shooting of computer monitors. Shutter speeds can be set from 1/60.5 to 1/196.7 of a second in 255 increments to precisely match the scan rate of the monitor.
- Tape/Battery Remaining indicator means you always know exactly how much tape and battery power remains.

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QUICK DIAL 74

SONY

DSR-PD100 3-CCD Mini DVCAM Camcorder

The smallest DVCAM camcorder, the DSR-PD100 is also the first one with built-in image capture capability. The highly compact camcorder features three 1/4" 380,000 pixel CCDs that allow two scanning modes: 480 progressive (for stills) or interlaced (for video).

- Three 380,000 pixel CCDs complement DVCAM with a high standard of quality for this class of camera. DVCAM offers superior video and audio quality, and reliability for professional use
- The CCD's can be switched to scan in two ways: Interlace Scan for recording moving images and Progressive Scan for recording still images
- Super SteadyShot compensates for unwanted camera movement without reducing image quality
- A built-in 12X zoom lens is supplemented by a 48X digital zoom that can provide really close up shots
- Manual control of focus, gain, white balance and shutter speed. Also has full automatic control
- i.LINK interface provides a single cable connection to transfer digital video and audio
- Records PCM digital stereo sound in both 48 kHz mode (16-bit) and 32kHz mode (12-bit). When a recording has been made in 12-bit mode, another stereo channel can be added later
- The DSR-PD100 has a 3.5" color LCD monitor with 184,000 pixels, opening 90° to the side and swiveling 180°. Also has a 180,000 pixel color viewfinder.
- Can record still images on both tape or removable media, such as Memory Stick
- Start/Stop/Zoom of the camcorder and VTR operation, plus slow playback or search can be controlled by the supplied wireless remote commander
- Supplied XLR adaptor attaches onto the hot shoe of the camcorder, allowing external professional microphones to be connected to provide high quality audio sources. Through XLR adaptor, DC power (+48V for a microphone is also supplied from the DSR-PD100
- A 0.7X wide conversion lens is supplied, complete with lens hood, lens cap and protective bag
- Includes 4 MB Memory Stick and Memory Stick/PC Card Adaptor
- Weighs just 1kg (2.2 lbs) with a battery and a tape. A magnesium alloy die cast body keeps it light but robust

DSR-200A 3-CCD Digital (DVCAM) Camcorder

Combining a compact and lightweight body with the superior picture quality of DSP (Digital Signal Processing) and the DVCAM format, the DSR-200A is the ideal acquisition tool for video journalists, event and wedding videographers, stringers and production houses. 500 lines of horizontal resolution, 48kHz or 32kHz digital audio, three hour record time, and minimum illumination of 3 lux is only the beginning. Other features include 16:9/4:3 capability, Steady Shot, high resolution 1-inch viewfinder, time code operation, time/date superimposition and an IEEE-1394 interface for direct digital output. Offers full automatic as well as manual control of focus, iris, gain, white balance and shutter speed.

- Variable servo 10X optical power zoom lens goes from 5.9 to 59mm in 1.7 to 24 seconds. The manual zoom rocker is continuously variable right up to where the digital 20X zoom kicks in.
- Sony's Super Steady Shot reduces high frequency camera shake without compromising image quality. SteadyShot uses horizontal and vertical motion sensors that allow it to work accurately while zooming, moving (even shooting from a car), and shooting in low light conditions.
- Has digital effects including audio and video fade, overlap and Slow Shutter.
- Automatic and manual focus, iris, shutter, gain and white balance. Iris is adjustable in 12 levels from F1.6 to F11, shutter from 1/4 to 1/10,000 of a second in 12 steps, Gain from -3dB to +18dB in 8 steps.
- Zebra Pattern indicator, bult-in ND filter.
- Custom Preset function lets you preset, store and recall custom settings for color intensity, white balance (bluish or reddish), sharpness and brightness.
- Stores Photo, Date/Time, Shutter Speed, Iris, Gain and F-stop for easy recall. So if you have to re-shoot, you know your original settings for every scene and frame.
- Records Drop/Non-Drop Frame time code. Time code can be read either as RC time code or as SMPTE time code
- Has a large 1-inch B&W viewfinder with 550 lines of resolution for easy focusing even in low contrast lighting situations. Separate information sub panel displays time code, battery time, tape remaining and other camcorder functions without cluttering up the viewfinder.
- Records 16-bit/48kHz audio on one stereo track or 12-bit/32kHz with two pairs of stereo tracks (L1/R 1, L2/R2), so you can add stereo music or narration.
- One-point stereo electret condenser mic for clear stereo separation. Directivity can be selected from 0°, 90° & 120°.
- Automatic & manual (20-step) audio level record controls. Monitor audio with headphones or from the LCD panel which has an active VU meter.
- XLR input connectors for mics and audio equipment.

DSR-200A Field Package:
- DSR-200A Camcorder • NPA-1000/B Battery Case Adapter
- 3 NP-F930/B 7.2v 4000 mAH Batteries
- AC-V900/B AC Adapter, Triple Battery Charger
- VCT-U14 Tripod Adapter • LC-2000CP System Case

DSR-20 DVCAM Player/Recorder

The DSR-20 is a versatile DVCAM VCR with a very compact chassis and a variety of convenient functions for recording, playback and simple editing. It features auto repeat playback, power-on recording/playback, multiple machine control interfaces, AC/DC capability and i.Link (IEEE1394) input and output. And of course, it offers the stunning image and sound quality inherent to the DVCAM format.

DVCAM Quality
- Dual-size cassette mechanism accepts both mini size (up to 40 minutes) and standard size DVCAM tapes (up to 184 minutes) without an adapter.

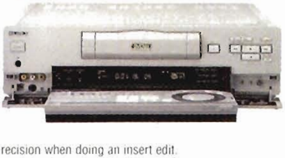
Editing Capability
- Equipped with Control L interface, the DSR-20 can perform simple time code-based editing when connected to another DSR-20 or other similarly equipped VCRs/cameras like the DSR-30, DSR-200A or DSR-PD1. When using the FXE-120 or ES-3 EditStation System, the DSR-20 can serve as a feeder player.
- Has DV (IEEE1394) input and output. When connected to other DV equipped machines, the DSR-20 offers digital dubbing of video, audio and data, without any deterioration of image and sound quality. In addition, in the "Digital dubbing including TC copy" mode, full information of video, audio and time code of the original tape can be copied to another tape. Especially useful when making working copies of the original.

Record/Playback Functions
- In addition to Control L, the DSR-20 also incorporates a Control S and RS-232 interface for remote control operation. Basic VCR functions can be controlled from a PC via RS-232, while Control S allows control via the optional DSRM-10 Remote Control. In addition, with the Control S input/output connector, two or more (up to 50) DSR-20's can be daisy-chained and controlled from one DSRM-10 Remote Control.
- External sync input enables synchronized playback with other VCRs. Especially important in A/B roll configurations.

Conveniences
- The DSR-20 be powered by AC or DC. Ideal for mobile applications, the DSR-20 can be connected to a 12V power supply like a car battery or battery belt & powered via the 4-pin XLR DC input.
- Can perform searches for Index Points, which are recorded on the tape as "in-point" marks everytime a recording starts. The DSR-20 can also search for photo data recorded on a DVCAM cassette by the DSR-PD100/200A/300, or where the recording date has been changed.
- Supplied with the RMT-DS20 Wireless Remote for control of basic VCR functions. And again, when two or more VCRs are connected via Control S, they can be simultaneously controlled from one wireless remote by simply sending one command to the master deck.

DSR-30 DVCAM Digital VCR

The DSR-30 is an industrial grade DVCAM VCR that can be used for recording, playback and editing. DV standard 4:1:1 sampling digital component recording with a 5:1 compression ratio provides spectacular picture quality and multi-generation performance. It has a Control L interface for editing with other Control L based recorders such as the DSR-200A DVCAM Camcorder or another DSR-30. It also has a continuous auto repeat playback function making it ideal for kiosks and other point of information displays. Other features include high quality digital audio, IEEE-1394 Digital interface and external timer recording. The DSR-30 can accept both Mini and Standard DVCAM cassettes for up to 184 minutes of recording time, and can playback consumer DV tapes as well.



- Records PCM digital audio at either 48kHz (16-bit 2 channel) or at 32kHz (12-bit 4 channel).
- Equipped with Control L, the DSR-30 is capable of SMPTE Time Code based accurate editing even without an edit controller. Built in editing functions include assemble and separate video and audio insert.
- By searching for either an Index point or Photo Data recorded by the DSR-200A camcorder, the DSR-30 drastically cuts the time usually required for editing. The DSR-30 can record up to 135 Index points on the Cassette Memory thanks to its 16K bits capability.
- Audio lock ensures audio is fully synchronized with the video for absolute precision when doing an insert edit.
- Built-in control tray has a jog/shuttle dial, VCR and edit function buttons. The jog/shuttle dial allows picture search at ±1/5 to 15X normal speed and controls not only the DSR-30 but also a player hooked up through its LANC interface
- DV In/Out (IEEE 1394) for digital dubbing of video, audio and data ID with no loss in quality.
- Analog audio and video input/outputs make it fully compatible with non-digital equipment. Playback compatibility with consumer DV tapes allows you to work with footage recorded on consumer-grade equipment. Tapes recorded in the DSR-30 are also compatible with Sony's high-end DVCAM VCR's.

QUICK DIAL 72

SONY

UVW-1200/UVW-1400A

Betacam SP Player • Player/Recorder

The UVW-1200 and UVW-1400A are non-editing VCRs which deliver Betacam SP quality and offer features for a wide range of playback and recording applications. RGB and RS-232 interface make them especially ideal for large screen, high quality video presentation, scientific research and digital video environments.

- Ideally suited for work in computer environments, because RGB signals can be converted into component signals and vice versa with minimum picture degradation.
- 25-pin serial interface allows external computer control of all VCR functions based on time code information. Baud rate can be selected from between 1200 to 38,400 bps.
- Built-in Time Base Stabilizer (TBS) locks sync and subcarrier to an external reference signal as well as providing stable pictures. High quality digital dropout compensator further ensures consistent picture performance.
- Equipped with two longitudinal audio channels.
- Both read LTC Time Code) and UB (User Bits). The UVW-1400A also generates LTC and UB (Free-Run/Rec-Run).
- Auto repeat of entire or a specific portion of the tape.
- Built-in character generator can display VTR status, time code, self-diagnostic messages, set-up menu, etc.
- Control of jog, shuttle, playback, record, pause, FF and REW with the optional SVRM-100A Remote Control Unit.
- Composite and S-Video as well as component via BNCs which are switchable to RGB output. The UVW-1400A has two switchable sync connectors and a Sync on Green.
- Built-in diagnostic function and hour meter.
- Initial set-up menu for presetting operational parameters. Settings are retained even after power is turned off.

UVW-1600/UVW-1800

Betacam SP Editing Player • Betacam SP Editing Recorder

The UVW-1600 and UVW-1800 are the other half of the UVW series. They offer the superiority of Betacam SP with sophisticated editing features. They feature an RS-422 9-pin interface, built-in TBCs and Time Code operation. Inputs/outputs include component, composite and S-Video. **All the features of the UVW-1200/1400A *PLUS*—**

- Optional BVR-50 allows remote TBC adjustment.
- RS-422 interface for editing system expansion.
- Two types of component output; via three BNC connectors or a Betacam 12-pin dub connector.
- Frame accurate editing is assured, thanks to sophisticated servo control and built-in time code operation. In the insert mode of the UVW-1800, video, audio Ch-1/2 and time code can be inserted independently or in any combination.

PVM-14M2U/14M4U and 20M2U/20M4U

13-inch and 19-inch Production Monitors

Sony's best production monitors ever, the PVM-M Series provide stunning picture quality, ease of use and a range of optional functions. They are identical except that the "M4" models incorporate Sony's state-of-the-art **HR Trinitron** CRT display technology and have SMPTE C phosphours instead of P22.

- HR Trinitron CRT enables the PVM-14M4U and 20M4U to display an incredible 800 lines of horizontal resolution. The PVM-14M2U and 20M2U offer 600 lines of resolution. M4 models also use SMPTE C phosphours for the most critical evaluation of any color subject.
- Dark tint for a higher contrast ratio (black to white) and crisper, sharper looking edges.
- Each has two composite, S-Video and component input (R-Y/B-Y, analog RGB).For more accurate color reproduction, the component level can be adjusted according to the input system. Optional BKM-101C (video) and BKM-102 (audio) for SMPTE 259M serial digital input.
- Beam Current Feadback Circuit
- 4:3/16:9 switchable aspect ratio.
- True multi-system monitors they handle four color system signals: NTSC, NTSC 4.43, PAL, and SECAM.
- External sync input and outputcan be set so that it will automatically switch according to the input selected.
- Switchable color temp: 6500K (broadcast), 9300K (pleasing picture), User preset.(3200K to 10000K).
- Blue gun, underscan and H/V delay capability
- On-screen menus for monitor adjustment/operation.
- Parallel remote control and Tally via 20-pin connector.

QUICK DIAL 731

PINNACLE SYSTEMS

miroVIDEO DC-30 *PRO*

PCI Capture Card for Windows 95/NT

Pinnacle Systems' miroVIDEO DC30 Pro is the ideal solution for creating professional quality video productions. If you create corporate, commercial, wedding, event, multimedia or Internet videos, the high-powered software bundle and state-of-the-art hardware of the miroVIDEO DC30 Pro gives you unbeatable results. Includes Pinnacle Systems' powerful TitleDeko character generator plug-in for Adobe Premiere 5.1. Add creative, custom titles toyour video productions with Emmy Award-winning technology. Use the full version of Adobe Premier 5.1 to capture, edit and output professional quality productions for video, multimedia, and the web with . Also includes 300 unique Pixélan Software Video SpiceRack transitions and a high quality video and audio breakout box. The breakout box allows for convenient placement of connections on your desktop.

DIGITAL VIDEO EDITING
miro

- 2.4:1 compression ratio for a better final video image quality. Compression ratios under 4:1 are considered to be "broadcast quality."
- Full NTSC, PAL, SECAM, for worldwide compatibility.
- Real-time video overlay on the computer monitor eliminates the need for an external video monitor.
- Professional breakout box brings your connections up front and easily accessible

Bundled Software:

- Full version of Adobe's Premiere 5.1 editing software gives you powerful editing tools to create professional productions
- Bring Hollywood-quality graphics to your video productions with TitleDeko. Easily add amazing titles to all of your video productions. Titles can fade up, scroll and even blend with pictures. Apply glows, neon and metallic looks, textures, shadows and shapes to your titles with any TrueType font.
- Pixelan Software's Spice Rack gives you over 300 transitions to choose from.
- Sonic Foundry's Acid Music software lets you create royalty-free music for your productions.
- MiroINSTANT Video saves time and disk space with accelerated, intelligent rendering. When rendering and playing your final production, miroINSTANT Video overcomes the 2GB AVI file size limitation, allowing you to quickly put more video directly onto tape – in one pass.

DC-30 *PRO* 799.00
NEW! DC-50 .... 1649.00

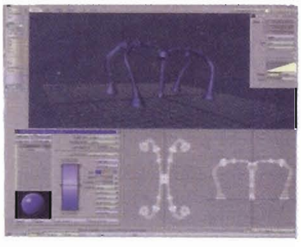
MiroVIDEO DC-30 *PRO* Turnkey System:
• 220-watt midtower case • Pentium 233 MHz MMX processor • PCI motherboard with 512K cache • ATI XPert-128 8MB PCI display card • 128MB of RAM • Quantum 3.2 GB IDE system drive • Seagate (Barracuda) 9GB SCSI-2 FAST/Ultra-wide hard drive • Initio 91004W Fast/Wide SCSI 2 controller • 3.5" floppy drive • Teac CD-532E 32X EIDE internal CD-ROM drive • Altec-Lansing ACS-43 2-piece speaker system • Focus 2001A keyboard • Microsoft MS mouse • Viewsonic GS771 17" 1280 X 1024 SVGA monitor • Windows 95 • MiroVIDEO DC-30 *PRO* video/audio capture card • Adobe Premiere 5.1 (full version) editing software, TitleDeko, Pixelan Software Spice Rack, Sonic Foundry Acid Music **$2495.00**

Minimum Shipping USA (Except AK & HI) $6.95, up to 1 lb. Add 75¢ for each additional lb. For ins. add 50¢ per $100. © 1999 B&H Photo - Video. Prices are valid subject to supplier prices. Not responsible for typographical errors.

NewTek LightWave [6]

3D Animation, Modeling and Rendering Software

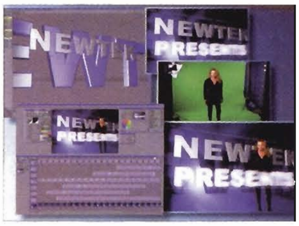
Explosive ideas that test the boundaries of 3D animation deserve a program that can realize them in exciting new ways. Creating worlds that no one's ever seen. Creatures that have never walked the Earth. Special effects, games, web sites - all creations that exist only in your mind. Until now............



The culmination of over ten years of development, LightWave [6] advances the state-of-the-art in professional 3D animation by adding a comprehensive set of groundbreaking character animation tools, advanced rendering capabilities, a new and improved architecture and a refined work environment. The three traditional areas of 3D, modeling, animating and rendering, have received massive enhancements in the new software. Among the thousands of changes in this completely redesigned system, LightWave [6] boasts real-time subdivision surfaces as a modeling and animation tool, radiosity, caustics, 160-bit floating-point rendering, a hybrid Inverse/Forward Kinematics engine and new character-animation technologies: LightWave, the recognized leader in the film and television industry, provides the most complete feature set of any 3D animation tool available—one of the reasons you can find LightWave 3D in more Hollywood animation suites than any other 3D program. And , LightWave [6] is the only 3D software system to run on Macintosh, Windows NT, Alpha and SGI.

Video Toaster

Tools for Broadcasting and Beyond



With a suite of tools for video creation including all the essential components for video editing, compositing and 2D/3D animation, the Video Toaster is an uncompressed D1 (composite, component, Y/C) Windows NT solution that offers a price/performance equation unmatched in the industry. Unique to the Video Toaster is a breakthrough technology developed by NewTek that turns a standard Pentium II or III processor into a highly specialized video DSP (digital signal processor) for time base correction and other capabilities typically associated with expensive custom chipsets. Superior to systems that cost tens of thousands of dollars the Video Toaster includes LightWave VT 3D animation software, Aura paint and compositing software and in-syncs Speed Razor 4.5 SE video editing software. Leveraging over 12 years of experience as an industry leader and pioneer in the desktop video, 3D, and 2D paint and animation markets, NewTek has created a product that contains award winning tools for creating better than broadcast quality television....at an unbeatable price!

Uncompressed Video— No Compromises

- The Video Toaster offers quality that's second to none. ALL video is ALWAYS stored in its native, uncompressed D1 video format. Unlike other boards that show compression artifacts, the Video Toaster maintains the original pristine quality no matter how many layers in your project.
- The Video Toaster allows you to manipulate uncompressed video in many ways, including traditional 2D compositing, rotoscoping, 3D animation and modeling and editing. By merging video into a 3D compositing and animation environment, editors will find a new paradigm for video effects and manipulation. The quality and capabilities of the Toaster are comparable or better than digital video editing costing $50,000 to $100,000.
- The Toaster provides an uncompressed D1 (composite, component, Y/C) digital video solution typically associated with extremely expensive systems. High-end facilities know that uncompressed digital video is essential to the editing process. Most compression-based systems are elegated to industrial and corporate video segments due to restrictions on the number of layers and quality degradation associated with multi-pass compression. All compressed systems produce unwanted artifacts. Because the Toaster utilizes uncompressed video, you can infinitely layer video without any concern about artifacts. This is the major separation between high-end and mid range systems. The Toaster brings that ultra high-end sophistication to users at levels at an unprecedented price point.

Powerful Editing

Video Toaster includes in-sync's powerful editing application, Speed Razor 4.5 SE.

- Project timeline that lets you easily create professional video projects containing unlimited layers of video, audio, still image files and animation.
- Comprehensive 2D compositing system
- The ability to capture, edit and output to uncompressed video and other formats, including ASF for video streaming on the Web and multimedia AVIs.
- Graphical workspace for digital media content management
- Real-time on-screen preview of edits
- Power character generator (CG).

Only three things are certain in life... death, taxes, and faster computers. NewTek's revolutionary Lucas Code technology allows the Video Toaster to evolve at the speed of processor technology. NewTek has always known that computers would continue to get faster and faster. So, several years ago, their engineers began working on a system that required a computer that was not even built yet. NewTek's philosophy is to use the computer's procesor, not bulky, proprietary expansion systems or non-expandable video cards that are sure to be outdated as soon as the silicon is pressed. Just imagine what will be possible next year, or the year after that, or the year after that...! With the Video Toaster, increased functionality is just a software upgrade away. Your investment won't be lost to future innovations.

Toaster Utilities

VT Director—Allows any program that supports cut and paste to display an image on a NTSC or PAL video monitor. Imagine working in Photoshop and being able to display your work on a video monitor with one keyboard shortcut.

ToasterVision—Allows you to preview both video input and output as well as animation on your RGB monitor at 720 x 480 resolution and full frame rate—60 fields per second.

ToasterScope—Keep your video legal as you work on it. The built-in waveform monitor and vectorscope lets you monitor your video input and output.

ToasterKey—Use ToasterKey in Aura to paint in realtime on your video monitor. You can also paint in realtime over live video. Bring frames into Aura from a live input with the frame grabber.

Additional Features

- Real-time uncompressed D1 recording and playback
- Real-time 60 fps (fields per second) on-screen preview
- Real-time software playback for video effects and overlays
- Real-time multi-track audio mixing
- Component, Y/C and composite I/O • 3D DVE
- Audio mixing and editing at 48 kHz • Still store/frame buffer
- Image stabilization and tracking tools
- Infinite layer 2D and 3D compositing
- 2D paint and image manipulation
- Complete 3D animation, modeling and rendering suite (LightWave VT)
- Chroma, color and luma keying
- 2D and 3D title generation
- Matte generation
- Uses SCSI/IDE NT stripe drives
- Optional SDI board includes AES/EBU digital audio I/O.

Hard Drives– How fast and how much?
The Video Toaster does not compress the video. All video is stored in its native uncompressed format. In order to accomplish this feat, a drive system capable of 22 MB/sec is required. Newtek ***has developed a small application that allows you to test your drives to determine their level of performance.***
Uncompressed video requires approximately 21 MB per second, or just under a minute per GB. Audio adds less than 200 KB per stereo channel.

Continuously Upgradeable —Guaranteed Against Dbsolesence

The Video Toaster was designed to last for years to come. Similar to the original Video Toaster for Amiga, which is still in production 10 years after its introduction, the Video Toaster utilizes a hardware system that leverages highly tuned software and the systems processor. The true power of the system comes from the proprietary software designed to create magic without the use of expensive video cards or bulky external hardware. By merging software and hardware, the Video Toaster can be upgraded and expanded well beyond current systems. NewTek will be adding modules for a real time 16-input switcher, DV I/O, storyboard editing, and ***real-time*** chroma keying and 3D DVE.

QUICK DIAL 732

VIDEONICS Effetto Pronto

Digital Video Effects and Compositing System for Macintosh

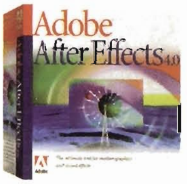
Effetto Pronto is a powerful combination of compositing and effects software, and a dedicated PCI hardware accelerator card. With a keyframe-based timeline compositing interface, Effetto Pronto blends all of the elements you want in your project.: video, graphics, 3D animation and anti-aliased text from the CG module. It even includes an audio track so you can animate to the beat of the music.

- Work with an unlimited number of tracks at any resolution
- Effetto is resolution independent so you can mix and match a variety of formats and seamlessly bring them all together
- Color correction, chroma and luma keying, 3D warps with perspective and 3D animatable lights.
- Advanced character generator offers unlimited text overlap, free-form text positioning, point and click typing, font and color palette thumbnails, drop shadows and glows and much more.
- Provides true 3D perspectives for your work. Any object can be rotated or warped on its X, Y, or Z axis, and can be positioned anywhere in 3D space.

Adobe

After Effects 4.0

The Most Powerful Tool for Compositing, 2D Animation and Special Effects



The industry-standard for professional motion graphics, After Effects is the most powerful tool available for producing high-end, unlimited composites, fluid animations, and sophisticated special effects. After Effects also generates the highest quality output at the desired resolution so it's the ideal design tool for film and video producers and editors, graphic designers, multimedia professionals and Web developers.

- Produce stunning special effects for broadcast, film, video and multimedia right from your desktop.
- Create animations for openers, bumpers, promos, commercials, music videos, titles, games, and more.
- Control layers with stunning precision. Combine unlimited layers of moving and still images.
- Add any number of keyframes, animate and apply special effects to each layer, and adjust those layers until the composite looks and moves exactly as you want.
- Enjoy precise control over every aspect of your composite—from sub-pixel positioning to controlling the shape and velocity of each animation path.

$629.95

ICE Final Effects Complete

Final Effects Complete is a premium set of 60 motion graphics effects' plug-ins for Adobe After Effects which create professional special effects for film, video and other digital video production. Final Effects Complete offers the ability to generate rain, snow, fire, smoke, bubbles, liquid mercury distortions, explosions, 3D particles, liquid displacement and lighting effects, a multitude of stylistic transitions and other video effects.

- 60 Hollywood-style filters and transitions- the same ones used in MTV and Fox promos.
- Full-featured 2-D and 3-D particle system. Create rain, smoke, fire, bubbles, ball action, confetti, jet trails, water ripples, cubes, star bursts, hair, liquid mercury blobs, fireworks and more.
- Particle World, an amazing 3D particle system with Z-depth and full camera tilt movement, lets you spray particle objects around your 2D image layers.
- Design unlimited effect combinations with interactive control over subtle compositing details. Effects can be animated over time to add even more sophistication.
- Incredible one-of-a-kind stylistic effects. Burn your image away like melting film. Paint in brush strokes with a glue gun. Scatterize every pixel of an image. Create psychedelic flowing backgrounds and kaleidoscope patterns. Flip your image like a page turning in a book to reveal another image. Materialize an image into glass or a blobby substance over time.
- Dramatic or subtle lighting with spotlights, multi-colored light rays, light sweeps and light bursts. Time controls for echo and motion blurring effects.
- Bend, slant, split, ripple, stretch, tile, twist and crumple your image or movie in an infinite number of ways. Turn them into a movable sphere or cylinder, rotate or manipulate them in any imaginable perspective without destructive clipping. The possibilities are endless.
- Remove tell-tale wires from blue screens. Create alpha maps and sepia tones, composite between effect and source, and even rotate between color values.

Final Effects

$799.95

QUICK DIAL 731

CTI DISK ARRAYS

for Mac and Windows NT

Video applications need extremely high data throughput to ensure high quality video. Using Ultra SCSI technology and Seagate Ultra SCSI 16-bit disk drives, CTI disk arrays provide high data of up to 80 MB/sec to ensure smooth clean video without dropped frames. Especially designed for audio and video applications, Seagate disk drives employ embedded servo technology, eliminating the need for thermal recalibration.

With a series of disk arrays fully tested for Windows NT and Mac PCI systems, CTI delivers the fexibility, performance and reliability you need at very competitive pricing.

Available in fixed and removable configurations, CTI arrays range from 8 GB to 180 GB per system and up to 1500 GB when daisy-chained.

Among the fastest in the industry, CTI Disk Arrays for Macintosh and PC are ideal for video and pre-press or any other application where absolute speed is essential. All solutions are based on world-proven Seagate Barracuda hard drives, and all feature steel chassis, extra capacity cooling fan, fixed or removable enclosures, push button SCSI selectors and Ultra SCSI performance. All include ATTO express PCI interface card, striping software, cables, active terminators and five year limited warranty.

- AV ready • Raid level 0 for high-speed data striping
- Push button SCSI ID selector
- Includes Seagate FAST Wide Ultra SCSI 16-bit high performance drives
- Incorporates striping software for Mac-based systems
- Uses ATTO single or dual channel PCI Ultra SCSI controller cards
- Multiple large power supplies • Efficient cooling and airflow
- Available in two and four bay towers (fixed and removable)
- All arrays include 5-year limited warranty

2 Bay Tower Fixed

CTI-8FS	8.4GB Array with 2 Seagate Barracuda 4.2GB Ultra Wide drives (#ST34572W) and Single Channel SCSI card (18.2 MB/s sustained transfer rate)	999.00
CTI-18FS	18.2GB Array with 2 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate)	1585.00
CTI-36FS	36.4GB Array with 2 Seagate Barracuda 18.2GB Ultra Wide drives (#ST118273W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate)	2375.00

4 Bay Tower Removable

CTI-36RS	36.4 GB Array with 4 Seagate Barracuda 9.1GB Ultra Wide drives ((#ST39173W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate)	3229.00
CTI-36RD	Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate)	3757.00
CTI-36R2S	Same as above with 2 Single Channel SCSI card (46.4 MB/s sustained transfer rate)	3999.00

2 Bay Tower Removable

CTI-18RS	18.2GB Array with 2 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate)	2166.00
CTI-18RSD	Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate)	2687.00
CTI-36RS	36.4GB Array with 2 Seagate Barracuda 18.2GB Ultra Wide drives (#ST118273W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate)	2999.00
CTI-36RSD	Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate)	3485.00

4 Bay Tower Removable

CTI-72RS	72.8 GB Array with 4 Seagate Barracuda 18.2 GB Ultra Wide drives (#ST118273W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate)	4809.00
CTI-72RD	Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate)	5289.00
CTI-72R2S	Same as above with 2 Single Channel SCSI card (46.4 MB/s sustained transfer rate)	5499.00

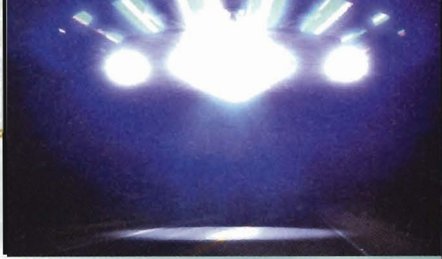


Figure 5

◄ 39

it ends up looking the way I want it to. In this case its a value of 1.

The next major controls are Luminosity and Opacity. As you can imagine, they are linked together pretty closely. The more opacity you add to the steam, the more you will need to boost the luminosity. It is best to stay low on the Opacity scale, since Steamer creates dark edges around the light beams when the beam gets denser. This tends to diminish the realism.

I think we can all figure out how to change the color sliders to get different beam colors. One thing to note about it though, is that there is no correlation between the actual light color and the beam color.

The last section is the area where all the good stuff happens. You can see this if you uncheck the [Fractal Noise] box and render a preview of the beam. All of the good detail in the beam is erased and you have a solid cone of light. For our project though, we want detail in the beam, and some motion put to it.

8. We can accomplish adding detail to our light cone by parenting the steam to a null. In the [Parent Object] popup, select "SteamerREF_(NO)". Now we have an object that we can move visually, to give us a better idea of how the steam will move in the scene.

The controls for Fractal Noise are as follows:

Frequencies: This is similar to the frequencies in the Surfaces Panel. The more frequencies you have, the more detail in the fractal.

Grain: This controls the coarseness of the pattern.

Big Scale(m): Control over the large details.

Small Scale(m): Control over the size of small details.

Contrast: Increases the sharpness of transition areas.

Amplitude: Increases the power of the fractal

Local Coordinates: Allows the whole pattern to be attached to the center point of the control object.

Filter: Type of pattern to be applied.

The numbers that I have come up with are by no means the only values that may look good in this scene. Please experiment with the values to come up with something different. After you have something you like, exit out of Steamer. If you stuck with the settings I provided, then a rendered frame at this point should look like [Figure 5.

Now it is time to turn our attention to the vehicle. As I mentioned last time, the plan was to use a different vehicle; but, the Porsche from the LightWave CD will do just fine for our purposes. Note that I have changed a few of the surfaces to match the vehicle from the original scene. The major surface of note is the "Windshield".

I have supplied a scene file that has the Porsche object in it, as well as a few lights. This scene is called "Porsche.lws". The scene also has the motion of the Porsche being sucked up into the UFO. I figured that by now you can learn just as much from viewing the actual motion file, as you would from typing in all the values I provide for you. So, I just added the motion to the "Porsche.lws" scene to speed things along.

9. Open the [Objects] Panel and select [Load from Scene]. Find the "Porsche.lws" scene file and load it in with all of its lights.

You will notice several things have been added to the scene along with the car. On the lighting side: two headlights have been added, as well as a point light on the ground called "GroundBounce". Since the UFO spotlight is shining so brightly on the ground, it would stand to reason that there would be some bounce from the pavement back onto the car. This is where the "GroundBounce" light comes in. If you look at the light from a view other than the camera, you will notice that it has a large ring around it. This is the area of falloff for the light. Since the bounce from the ground would diminish as the vehicle rises away from the road, this fall off simulates that.

The next addition to the scene is an image called "Wipers_HiCon.iff" and it should look like Figure 6. When it is applied to the "WindShield" surface as a Specular Map, it adds wiper blade trails. Since the car is such a small object in the scene, choosing the areas where the most detail will be noticed is important. The windshield was reflecting so much Specular, that breaking it up with a texture map added a new dimension to the scene.

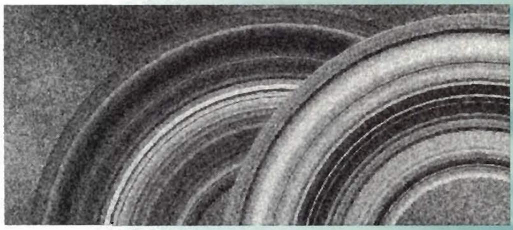


Figure 6

10. To take a look at how our project has come together, go to frame 86 and Render [F9]. The result should look like Figure 7.

Congratulations, you have now finished this year's assignment. With the completion of this tutorial, we also bring this series to a close. I hope that you have had as much fun doing these tutorials as I have had writing them. Good luck and keep learning.

Scott Wheeler is one of three authors of LightWave 3D Applied. You can email him at uberscott@uberfx.com

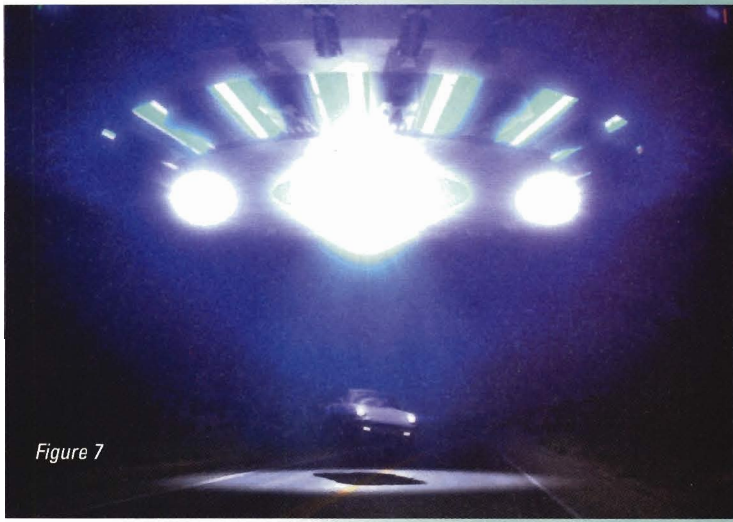


Figure 7

Texture & 3D Model Libraries for Lightwave 3D

SURFACESROM

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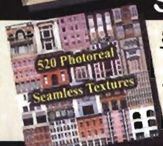

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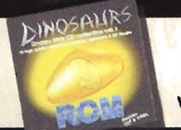

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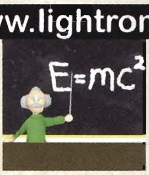

"Einstein" by Jamie Cope www.destiny images.com

$39.95

"Peugeot" by Ingo Haverich Independentarts@ T-online.de

"Opera" by Frank Maturi www.wild dog1.com/ frank.htm

"Fairy" by Alex Lugones www.wild seed3d.com

"Frog" by Don Drennan http://home. sprynet.com /~ddrennan/ home.htm

"Pufferfish" by www. burningham studios.com

Loren Sharp www.geo cities.com/ capecana veral/ hanger/6004

Graphic Detail Inc., 4556 South 3rd St., Louisville, Ky. 40214 USA ~ Mastercard & Visa accepted
Shipping is $4.95 for U.S., Canada & Mexico - $7.95 International ~ Bundle shipping is extra.
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All CD-ROMs work on any platform and are L[6] compatible (including all LIGHT-ROMs)

Web #212

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We are currently running specials on all Video Toaster NT systems. For a limited time all current Amiga Toaster and PC Lightwave owners save $1,000 off of the list price. Frame Factory owners can upgrade to the full Video Toaster software for only $599.

Flyer, Trinity and Media 100 systems are always available for demo. In business since 1987, ACS Video is your one stop shop for all digital video hardware, related accessories and service. We specialize in Amiga and Video Toaster repairs and upgrades. We keep all parts in stock for fast turnaround.

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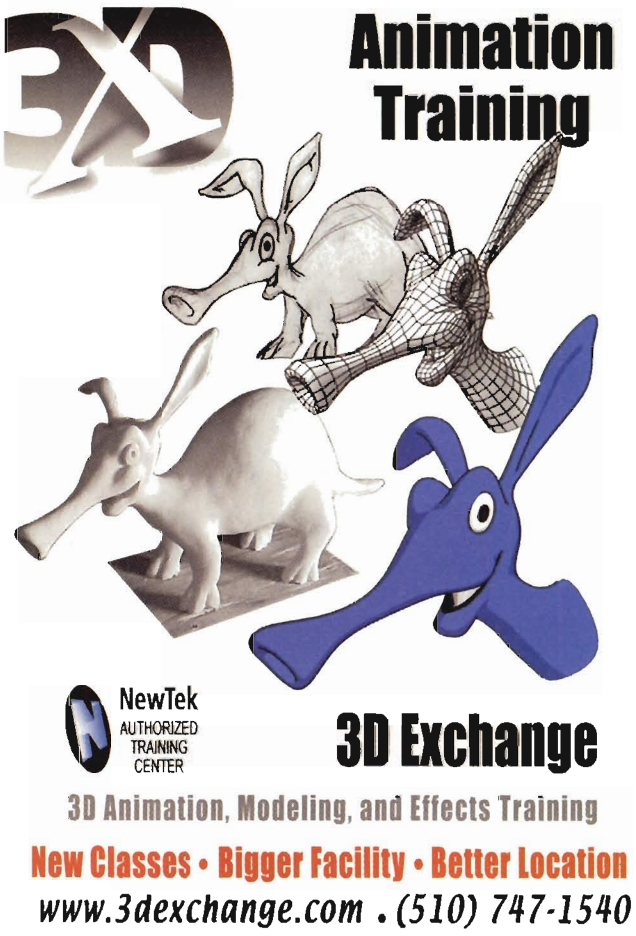
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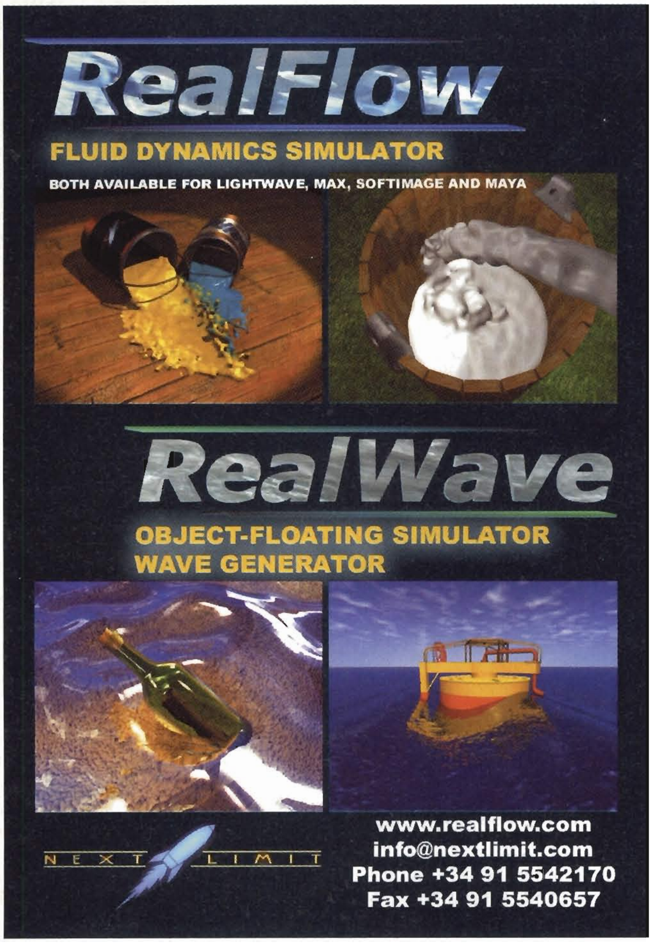

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MOJO
MUSINGS FROM OUR ACE LIGHTWAVE ANIMATOR

If you want to be an animator in Hollywood, the time is NOW.

by Mojo

START YOUR ENGINES!

The 3D Animation Rally Is About To Start

Ladies and Gentlemen, the tide is turning. A storm is a'comin' this way, and you best be prepared! Sometime during the next year, a black hole for animators is going to form in Hollywood; it will be a monstrous force, devouring all 3D artists that come near, and if you can't manage to land a job when THAT happens... you must really want to flip burgers!

In case you've just entered the world of LightWave, and haven't heard the news, Foundation Imaging is knee-deep in *Roughnecks: Starship Troopers Chronicles*, a new animated television series based on the movie *Starship Troopers*. Originally, the plan was for the show to be traditionally cell animated; but at the 11th hour, Foundation demonstrated what could be done with 3D cel animation, and the decision was made to produce the program entirely with LightWave!

With almost no time to prepare, we had to quadruple our staff, research and develop completely CG human characters, build all the objects, and set up a full time motion capture stage. A project like this had never been attempted before and, as with the *Babylon 5* pilot, the dauntless *Troopers* team (headed up by caffeine industry poster boy, Jeff Sheetz) had to make up the rules as they went along.

The sixty or so people working on the show in the beginning, barely had time to sleep and suffered from blistered mouse hands. But, rest assured, the results are spectacular! Despite the incredible pressure of having to produce a DAILY, 30 minute, all-CGI program, the work is of such high quality that you will forget you're watching animation. Any bias that people might have against an animated series (read: cartoon) will be a moot point as this photo-realistic program knocks the socks off all those who watch it.

In fact, even before the show had aired, Hollywood was already buzzing about the new breed of 3D animated series. Several new CGI programs have started pre-production, and no doubt there will be many more to follow now that *Troopers* has hit the airwaves. Every studio will want a piece of the action.

Now, in case you're not reading between-the-lines, let me spell it out for you. Foundation had a VERY tough time finding good animators for this show. People were pulled in from all over the world! Because of the computer graphics boom in Hollywood during recent years, many of the good animators already had jobs. In addition, unlike a team of maybe a dozen people needed to produce visual effects for a movie, we needed at least *fifty* new people - and even *that* wasn't enough, which is why several other 3D studios (including Flat Earth) were brought on board to tackle the job.

All in all, Hollywood had to do a lot of serious barrel scraping to come up with the 100+ animators now working on this show. Undoubtedly, a few hundred more will need to be hired by various studios for the next crop of 3D animated series - and even more when the surge really kicks in.

Are you seeing the writing on the wall, my friends? At the moment, there simply aren't enough good 3D animators in the world to make all these shows a reality! A few years ago, Hollywood was hungry for CG visual effects artists for film and television. Next came the need for animators to create CGI movies, and now we are at the cusp of the next evolution - entirely computer generated television shows.

If you want to be an animator in Hollywood, NOW is the time to get cracking on that demo reel. Even if you're just thinking of learning how to animate, you have plenty of time to pick up on the basics. During the next few years, the demand for 3D artists is going to be staggering. There will be a need for animators at every skill level – from novices who can do scene clean up to the seasoned professionals who will be needed to supervise entire episodes. It's even possible that the production process will mirror that of current cel animated fare made in Korea, except the work force won't be 14 years old and earning a dollar an hour (or so I hope).

A good number of these shows will likely be made using LightWave, which is already the workhorse of the industry. This being the case, I'd guess that nearly every person reading this magazine will be qualified to get a decent job in Hollywood – very, very soon. In fact, while you're out buying the blank tape for your demo reel, you might as well pick up a flashlight and a battery powered radio! You'll need them out here.

Mojo is an Emmy awarded Senior Animator at Foundation Imaging.
You can email him at mojo@foundation-i.com

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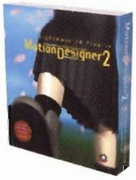

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